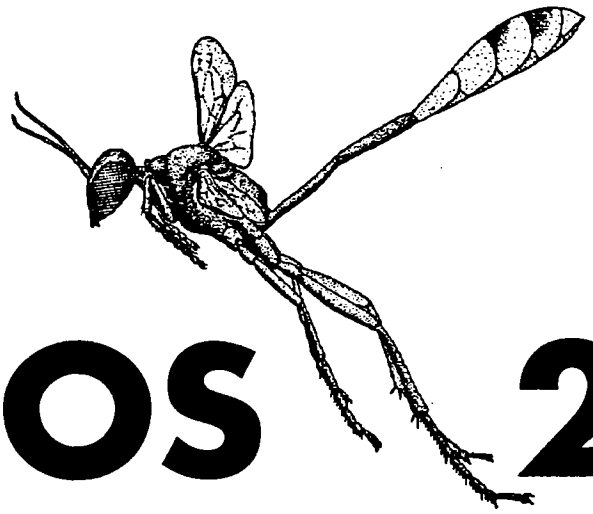

JULY 1993

SPHECOS 25

A FORUM FOR ACULEATE WASP RESEARCHERS

The Mud D'aub Speaks

A number of individuals responded to my "Cloudy future for Sphecos?" note on the front page of **Sphecos 24**. Justin Schmidt of Tucson and Jacques Hamon of Gaillard, France, both came up with suggestions that may offer a means of circumventing the possible demise of **Sphecos**. Others sent unsolicited letters to my boss, Douglas Miller, telling him how important **Sphecos** is to them, and the consequences for the world of wasp research if **Sphecos** were to disappear. To those of you who responded, I thank you, your support is appreciated. I don't want the newsletter to disappear any more than you do. USDA budgets for fiscal year 94 are not yet known, but they will surely be reduced from FY93 figures, but hopefully **Sphecos** will survive somehow.

This issue includes an interesting collecting report by Servio Amarante of São Paulo, Brazil. He has been surveying Hymenoptera in the dry area of northeastern Brazil: the states of Bahia and Piaui. He has collected some amazing wasps in the region, a few of which extend the known distributions of three sphecid genera far northward. This long neglected region is likely to contain many more exciting critters. It is time to forsake the jungles and get into the deserts of Brazil!

I had three long term visitors last year. Servio Amarante arrived in September to begin his revision of the sphecid genus *Penepodium* for his doctorate. He was here about two months. In October, 1992, Enrico Negrisolo of Padua, Italy arrived to begin his revision of the sphecid genus *Liris* in the New World.

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This postdoctoral research will take him some time to complete due to the size and complexity of the genus. Enrico returned home at the end of March, 1993. Eduardas Budrys of Vilnius, Lithuania, arrived at the end of October to study our Pemphredoninae. Eduardas was only here for a little more than two weeks unfortunately, but he worked long hours and accomplished much during his short visit. I was very impressed by these three young men, the next generation of sphecologists, and it was a great experience having them around. All three left with much more baggage than they came with! Servio and Eduardas left the USA with brand new computers. Servio had so much stuff I don't know how he managed to get it all on the airplane.

RESEARCH NEWS

Richard Bohart (Dept. of Entomology, University of California, Davis, CA 95616-8584) writes: "My paper on *Belomicrus* has finally been typed. It is nearly 50 pages doublespaced. I have had a manuscript of *Pterocheilus (Micropterocheilus)* on my desk for more than a year. It is not totally satisfactory. Anyway, I am dividing it in half by taking out the five mostly all red species (three new). That means more work, including a rearrangement of illustrations."

James M. Carpenter (Dept. of Entomology, American Museum of Natural History, Central Park West at 79th Street, N.Y., N.Y. 10024) reports: "My study of the subgenera of *Polistes* is nearing completion (June 15 deadline!). Analysis of the subgenera shows four main lineages, *Nygmopolistes* + (*Gyrostoma* + *Megapolistes*), *Polistella* + *Stenopolistes*, and (*Polistes* + *Sulcopolistes*) + the five American subgenera. *Polistella* and *Polistes* are definitely paraphyletic, and monophyly of *Nygmopolistes* is only weakly supported. Breaking *Polistella, Aphanilopterus* and *Epicnemius* into species-groups for analysis extends the conclusions to include rejecting *Aphanilopterus* and *Epicnemius.* I will reclassify the subgenera into four, *Polistes, Gyrostoma, Polistella* and *Aphanilopterus.* Biogeographic analysis leads to rejection of the traditional center of origin in the Oriental tropics, in favor of gondwanian origin with the main split between the Old World (African + Oriental) and New World tropics."

Arkady Lelej (Institute of Biology & Pedology, Vladivostok-22 690022 Russia) writes: "I am now working on the phylogeny and classification of the higher taxa of Scolioidea with special reference to Mutillidae, but first I must prepare my doctoral thesis before the end

of 1993. So I will be very busy this year, but when I'm somewhat free I want to prepare a paper on this problem. The preliminary results differ from those of D. Brothers."

Donald G. Manley (Pee Dee Res. & Educ. Center, Route 1, Box 531, Florence, SC 29501-9603) writes: "I am working on a revision of the *Dasymutilla* of North America. My trip last summer was a 6-month study leave (sabbatical), with the travel being supported by an NSF grant. I am applying for another NSF grant to help me finish the project (analyze the data and get it in print). I hope to have the final product in about two years. It makes for slow progress when I am able to devote only spare time to the project. The 6-month sabbatical allowed for considerable progress. The NSF grant, if approved, will help support a graduate student to work on the project. That, too, will help speed things up."

Arnold Menke is collaborating with **Fernando Fernandez** of Bogotá, Colombia on a manuscript that will provide keys in Spanish to neotropical sphecid genera and higher categories. Arnold and **Paul Hanson** have completed a general review of the Sphecidae of Costa Rica for the forthcoming book on the *Hymenoptera of Costa Rica* (Oxford University Press), edited by Paul Hanson and Ian Gauld. Arnold and **Woj Pulawski** have begun work on their new catalog of Sphecidae. This will be a long term project. The goal is to update the checklists included in *Sphecid Wasps of the World*, with new taxa and new synonymy published since 1976. Type information for all species taxa will be included so far as possible. The bibliography will include references for all published names. Generic names and their synonyms will be placed at the head of their respective species lists. References to keys, taxonomic discussions, biology and the like, will be cited under the genus when appropriate. Arnold continues working on his revision of the New World *Ammophila*, much to the chagrin of his doubters. With thousands of specimens on hand, this too will be a fairly long term project.

Karl Krombein and **Beth Norden** (National Museum of Natural History, Washington, DC 20560) left 6 July for Colombo, Sri Lanka for several weeks in the field. Following the field work there will be visits to several collections in India.

Sean O'Donnell (Dept. of Entomology, 237 Russell Laboratories, 1630 Linden Drive, Madison, Wisconsin 53706) tells us: "I recently returned from a blissful week of wasping on the upper Amazon and lower Napo Rivers in Loreto Province, Peru. I noted the Ashmead Club plaque at Peter Jensen's Explornapo Camp; is there no place left untainted? The (eusocial) wasp collecting was fantastic, as nearly every colony I encountered during the week was a new species for my life list. I regretted having to leave the fantastic diversity to return to late winter Wisconsin-style."

Till Osten, (Staatliches Museum für Naturkunde, Rosenstein 1, D 7000 Stuttgart 1, Germany) writes: "While working on phylogenetic questions in the group formerly called 'Scolioidea' I have established that taxonomy in the palaearctic Scoliidae, even in the western palaearctic ones, is really a horror. To solve these problems I have gone through many collections and much literature. After talking about my problems with Ron McGinley last May in Madrid, Karl V. Krombein was informed of my situation and offered to have me to come to Washington to study the scoliids in the Smithsonian. This trip from March 8-21 was supported by a short term visitors grant from the Smithsonian. For me it was really a great surprise to see that there where some series of very interesting material from western and eastern palearctic areas. Many species were studied for the first time. With the kind help of Karl and Beth Norden I succeeded in going through this material in about two weeks. (The only limiting factor at that time was a big snowstorm). During this time I made a short trip to George Eickwort at Cornell University, Ithaca. Here J. Chester Bradley worked for many years on the taxonomical problems of scoliids. As a result, Cornell has a remarkable scoliid collection. With the kind help of George I was able to go through this interesting collection.

"Looking back, I must say that it was definitely worthwhile and also a pleasure to come to the U.S. and to study this interesting material. Another very important aspect of my trip was to get in personal contact with my colleagues, to talk with them, to learn of their problems and to have a look at museum management. Of course there is still lots to do in these scoliid collections, but this was one step forward in better determining and arranging the collections. I want to thank all my colleagues at the Smithsonian and Cornell for their kind help."

Christopher O'Toole (Hope Entomological Collection, University Museum, Oxford OX1 3PW, U.K.) reports: "Since October 1991, I have returned, after many years, to working on bee systematics. At first, I entertained the fantasy that I could carry on with the mutillids as a side-line, but, as reality began to impinge, I had to admit to myself that I could not do justice to both bees and mutillids in the time scale allowed for me to complete the DPhil. Although now registered as a post-doc student, I am required to continue with my normal curatorial duties, including the work on the type series of aculeates split between the NHM and us. I have therefore had to come to terms with giving up the work on the Mutillidae.

"I have now finished processing the Smith type series of Sphecidae split between us and the NHM and have made a start on the Cameron sphecids. I intend to publish all this if I can find a journal still willing to deal with such large, annotated catalogues."

Colin Vardy (Dept. of Entomology, The Natural History Museum, Cromwell Road, London SW7 5BD UK) reports: "*Pepsis* continues; the last major problem in the phylogenetics of Part 2 is virtually resolved; to finish this part I need to make a few more illustrations and write up the biogeography (which is absolutely fascinating). The taxonomy of the entire genus (130 species) is finished, including descriptions and maps (only a single female remains unassociated, and no unidentified specimens); structural keys have been make to the species of 4 mimicry groups. It may eventually prove impossible to provide standard keys to the females of all the smaller species to be dealt with in subsequent parts, except perhaps on a regional basis."

HELP NEEDED

Eric R. Eaton (2812 Price Avenue #3, Cincinnati, OH 45204) "I am currently seeking work as a naturalist/ educator at an insect zoo, museum or nature center, preferably in the southwest U.S., and ideally with an emphasis on interpreting the lives of insects and related arthropods. I would consider moving overseas (particularly Australia or South Africa) if job prospects are better there.

"I would also like to make my specimens available for loans (by family level), in exchange for identifications, to any scientists in need of specimens. I have around 10,000 aculeates in my collection."

Jan Willem van Zuijlen (Nationaal Natuurhistorisch Museum, Postbus 9517, 2300 RA Leiden, The Netherlands) writes: "As Dr. Menke already mentioned in **Sphecos** 22, I am working on a phylogenetic analysis of the Sphecidae (as a PhD student). At the moment I am studying the genera (and subgenera) of the Nyssoninae. For my study I rely mainly on the extensive sphecid collection of the Nationaal Natuurhistorisch Museum in Leiden (former Rijksmuseum van Natuurlijke Historie). Thanks to great hymenopterists like van der Vecht, van Lith and Verhoeff, there is material of many genera in this collection. Only recently the important collection of Raymond Hensen was also donated to the Museum. In spite of all the contributions of these hymenopterists, not all genera are represented in the collection. Within the Nyssoninae, the following genera are lacking: *Acanthocausus, Hyponysson, Nippononysson, Tiguipa, Neonysson, Hovanysson, Carlobembix, Cresson, Antomartinezius, Losada, Idionysson, Neogorytes, Hemidula, Trichogorytes, Austrogorytes, Xerogorytes, Eogorytes, Psammaletes, Perisson, Handlirschia, Tanyoprymnus, Nursea, Pterygorytes, Psammaecius, Liogorytes, Arigorytes, Selman* and *Xerostictia.* If anybody has material from these genera, I would very much apreciate it if they could send me some material. For sphecids in general, we have only very limited material from Africa and Australia, and I would like to get in contact with people who can help me see specimens from these regions.

"In the near future I plan to be in contact with people like **Byron Alexander**, **Michael Prentice** and **Michael Ohl** who are also engaged in the phylogenetic analysis of Sphecidae, to avoid duplication of effort."

NEW ADDRESSES

Eduardas Budrys: Institute of Ecology, Akademijos 2, Vilnius 2600, Lithuanian Republic.

Dr. Y. Hirashima: President, Miyazaki Municipal University, Miyazaki City, 880 Japan.

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Dr. Alois Kofler: Meranerstraße 3, A-9900 Lienz Iositirol, Austria.

Dr. Rolf Kohring: Institute of Paleontology, Freie Universitaet Berlin, Malteserstrasse 74-100, Haus D, 12249 Berlin, Germany.

Dr. R.J. Paxton: Ecological Research Station of Uppsala University, Ölands Skogsby 6280, S-386 Färjestaden, Sweden. (From 1 May to 30 Sept. 1993)

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Paul Hanson, San Jose, Costa Rica: 506-249367

Yosiaki Itô, Kokuba, Naha, Okinawa Japan: 81-98-888-3116

István Karsai, Debrecen, Hungary: (36) 52-10936

PEOPLE IN THE NEWS

Dr. Y. Hirashima was recently appointed as President of Miyazaki Municipal University, Miyazaki City, Japan.

Yosiaki Itô writes: "I retired from Nagoya University on March 31, and became a professor of a small private university on Okinawa. I will enjoy many interesting insects including eusocial wasps and aphids on this subtropical island and also work for the conservation of natural areas."

MISSING PERSONS

Dr. Maria de Almeida Correa of Braga, Portugal

Jocelyn Chu of New York, N.Y.

Jeremy Field of Cambridge, U.K.

Bruce W. Johanning of Baldwin City, Kansas

Juan M. Labougle of Palo Alto, México D.F., Mexico

Ms. Sammie J. Merritt of College Station, Texas

Frank Plucken of Heinsberg-Unterbruch, Germany

RESEARCH TRAVEL IN THE FORMER USSR

The Russian Section of the I.U.S.S.I. was organized in 1989 originally as the All-Union Entomological Society Section for the Study of Social Insects. Now we have about 60 members in nearly all the republics of the former Soviet Union.

Recent political and economic developments in the former Soviet Union have made normal life and work for scientists here utterly impossible. Inflation exceeded 10,000% last year but the funding of science and education did not increase adequately. There is a considerable shortage of funds just to maintain and repair our laboratory equipment and we have no money to purchase any new equipment. The funds for scientific expeditions were substantially reduced and now we have almost no opportunity to go on collecting trips. The salaries of most scientists are now under subsistence level. The situation is not yet intolerable, however, and we hope that in a few years the economy will recover and stabilize. Most of us do not intend to emigrate to the West. We see our long-term future in Russian science. But we need help and support to survive this difficult period of financial embarrassment for Russian science.

Therefore we appeal to all our colleagues abroad with the suggestion to create and develop mutually beneficial

relationships with members of our section. Let us work out some joint scientific projects to pursue in Russia and other former Soviet republics. Due to the extremely low value of the ruble (now almost 1000 Rb for $1), travel in the former Soviet Union is extraordinarily cheap for foreigners, especially if they are able to make all their arrangments with the aid of Russian friends. We can assist you in reaching any part of Russia or the former Soviet Union for field work or for other purposes. If you succeed in obtaining grants or other funds for such joint projects, we would be able to organize scientific expeditions to any region of our country. These expeditions would be considerably less expensive compared to similar trips in any other country. For us each expedition would be a unique opportunity (now that we have no money for expeditions at all!) to go to some interesting regions for field collecting and research. In addition, such joint projects would help us obtain substantial financial support for our laboratory work and simply for our existence in this country, and would help us outlast this period of economic trouble in Russia.

We call on you to make the effort to find opportunities and funds to develop joint scientific projects in Russia. These projects will be equally productive and beneficial both for you and your Russian colleagues.

We are very much looking forward to hearing from you about possible joint projects and/or expeditions in Russia and the former Soviet Union.

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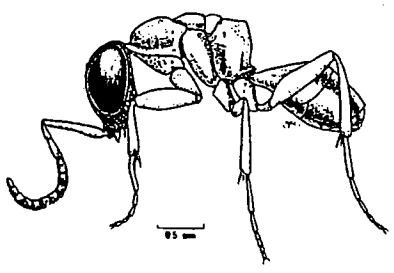

Reidia turneri Krombein
(Chrysididae: Amiseginae, from South Africa)

JOURNAL OF HYMENOPTERA RESEARCH

**Contents of Vol. 2,
due out August 1993**

S.R. Shaw - Systematic status of *Eucystomastax* Brues and Characterization of the neotropical species (Hymenoptera: Braconidae, Rogadinae).

D.W. Davidson and D. McKey - The evolutionary ecology of symbiotic ant-plant relationships.

A.P. Rasnitsyn - Archaeoscolinae, an extinct subfamily of scoliid wasps (Insecta: Vespida = Hymenoptera: Scoliidae).

A.S. Menke - A new species of *Apocharips* from Costa Rica (Hymenoptera: Cynipoidea, Charipidae).

T. Piek - New neurotoxins from venom of aculeate Hymenoptera: a contribution to the knowledge of stinging behaviour.

S.L. Heydon - *Syntomopus* Walker: the Nearctic species with a review of known host associations (Hymenoptera: Pteromalidae).

P.S. Ward - Systematic studies on *Pseudomyrmex* acacia-ants (Hymenoptera: Formicidae: Pseudomyrmecinae).

J.M. Heraty, D.P. Wojcik and D.P. Jouvenaz - Species of *Orasema* parasitic on the *Solenopsis saevissima* complex in South America (Hymenoptera: Eucharitidae, Formicidae).

G.A.R. de Melo and L.A. de O. Campos - Nesting biology of *Microstigmus myersi* Turner, a wasp with long-haired larvae (Hymenoptera: Sphecidae, Pemphredoninae).

I. Togashi - Sawflies of the genus *Perineura* Hartig from Japan (Hymenoptera: Tenthredinidae).

J.F. Genise and L.S. Kimsey - Revision of the South American thynnine genus *Elaphroptera* Guérin-Méneville (Hymenoptera: Tiphiidae).

V.L. Kazenas and B. A. Alexander - The nest, prey and larva of *Entomosericus kaufmani* Radoszkowski (Hymenoptera: Sphecidae).

D.J. Brothers and J.M. Carpenter - Phylogeny of Aculeata: Chrysidoidea and Vespoidea (Hymenoptera).

A. Willink and A.R. Alsina - Scientific Note: On *Odynerus rachiphorus* Schletterer, a Masarinae (Trimeria), not a Eumeninae (Hymenoptera, Vespidae).

OBITUARY

**Erik Tetens Nielsen
(1903-1992)**

A pioneer in the study of insect behavior passed away in April, 1992 at the age of 89. Erik Tetens Nielsen's work on *Bembix* and other Hymenoptera in the twenties, thirties and forties established him as a behaviorist of the first rank. A few years ago, he gave readers of **Sphecos** a synopsis of his early days and his work with wasps (**Sphecos** 9:19-22).

By the end of WWII Erik had turned his attention to mosquito swarming behavior, butterfly migrations, and other things. Early in 1949 he moved to Florida where, thanks to Richard Archbold, he and his family lived at the Archbold Field Station. There he took up the study of the migratory habits of the Great White Butterfly, *Ascia monuste*. After a year or so, Nielsen began working on mosquitoes for the Florida State Board of Health in Vero Beach where he remained for about 10 years. In 1961 Erik returned to his native Denmark as professor in the University of Aarhus. There he took up the study of rhythmic behavior, mostly with grasshoppers and crickets. He often spent his spring months in Morocco.

In March 1973 Nielsen moved back to Florida to live with one of his daughters. He used the Sherwood Hammock Biological Laboratory in Fort Pierce as a homebase for his studies of rhythmic behavior. In 1987, at age 84, Erik finally got back to his first love, wasps. He began to observe a colony of *Sphex jamaicensis* (see **Sphecos** 17:3-4). Erik established that this species is a progressive provisioner. Within a year Erik had constructed a "House" of tubes so that he could observe tube dwelling Hymenoptera. He devised an infrared sensor to monitor the comings and goings of the inhabitants (see **Sphecos** 18:14). Because his observations were incomplete, they were never published, but in 1989 he gave a talk about his wasp studies at Vero Beach, Florida. We have printed excerpts from this talk in the Scientific Note section.

The day before he succumbed to heart failure, Erik was out stalking migrating butterflies.

Arnold Menke

FORUM

Some Thoughts on Parapsides

by
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Thank you, Arnold, for an interesting FORUM topic (**Sphecos** 24:9)!

The use of a system of terms is based essentially on the insect group and/or on national traditions, or even on personal inclination. A good example is the use of **pro-**, **meso-** and **metasoma**. A similar case occurs with **parapsides** and **notauli**. Most European hymenopterists have used the term **parapsides** (mainly after Schmiedeknecht) for the furrows Americans call "notauli". I think everybody can find reasons for believing that his use of the terms is the only right one. So I propose my reasons for using **parapsidal furrows** sensu Mayr:

1. "Parapsidal lines" sensu Emery (1900) as well as analogous admedian lines ("anteroadmedian" sensu Daly, 1964 and Gibson, 1985) appear only in some Hymenoptera, namely Orussoidea and Apocrita. As far as I know there are no homologous structures in the scutum of other orders.

2. The terms **parapsides**, **parapsidal lines** or **parapsidal furrows** are used also in thorax morphology in other orders of insects, as far as I know, mostly for scutal structures located between the areas of attachment of longitudinal and dorsoventral indirect flight muscles, i.e. homologous to parapsidal furrows of Hymenoptera sensu Mayr (1887) (= notauli). In my opinion, this is a strong argument to use the term **parapsidal furrows** also in Hymenoptera for the grooves called notauli, but not for "parapsidal lines" sensu Emery (1900) (I realise that a historical analysis of the use of these terms in all orders of insects would be appropriate here, but that is a topic for a separate large article). In this respect Arnold's assertion that "most contemporary workers use parapsidal lines sensu Emery (1900) and Tulloch (1929)..." is too broad; it should be changed to "most contemporary American Apocrita workers..." or something similar.

3. "Parapside" of MacLeay (1830) is the lateral part of scutum; when not separated by a furrow it can be more exactly defined as the area of attachment of the dorsoventral indirect flight muscle as in *Chalcis*, MacLeay's example of an insect bearing completely formed parapsides. Consequently, the term "parapsidal" could be used for both structures: "parapsidal furrow" (= "notaulus"), delimiting the parapside medially, and "parapsidal line", located in the middle of parapside (for the difference between the terms "furrow" and "line" see Daly, 1964 and Gibson, 1985). But such usage should not be recommended because of possible confusion. Personally, I think the best solution would be to use **parapsidal furrow** or its shorter synonym **notaulus** for the parapsidal furrow of Mayr (1887) and creating of a new term for "parapsidal line" of Emery (1900).

4. On the advise of Rasnitsyn and in analogy to similar admedian lines, I have recently used a term **adlateral lines** (E.R. Budrys and V.L. Kazenas, 1992: 24) for the "parapsidal lines" sensu Emery (1900) and Tulloch (1929).

Literature cited

Budrys E.R. and V.L. Kazenas, 1992. [Novye vidy royushchikh os roda *Diodontus* (Hymenoptera, Sphecidae)] New species of digger wasps of the genus *Diodontus* Curtis (Hymenoptera, Sphecidae). Zool. Zhurn. 71(8): 24-31. (in Russian, summary in English)

Daly, H., 1964. Skeleto-muscular morphogenesis of the thorax and wings of the honey bee *Apis mellifera*. Univ. Calif. Publ. Ent. 39:1-77.

Emery, C., 1900. Intorno al torace delle Formiche e particolarmente dei neutri. Bull. Soc. Ent. Italiana 32:103-119.

Gibson, Gary, 1985. Some pro- and mesothoracic structures important for phylogenetic analysis of Hymenoptera, with a review of terms used for the structures. Canadian Ent. 117: 1395-1443.

MacLeay, W. S. 1830. Explanation of the comparative anatomy of the thorax in winged insects, with a review of the present state of the nomenclature of its parts. The Zoological Journal 5:145-179, pls. 5 and 6.

Mayr, G., 1887. Südamerikansiche Formiciden. Verh. zool.-bot. Ges. Wien 37:511-632.

Schmiedeknecht, O. 1930. Die Hymenopteren Nord- und Mitteleuropas. Zweite Auflage. Gustav Fischer, Jena. 1062 p.

Tulloch, George S., 1929. The proper use of the terms parapsides and parapsidal furrows. Psyche 36:376-382.

Notauli and Parapsidal Lines - A Comment

by
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The note by Arnold is an important piece of history of the terms involved. It is impressive enough to persuade me to stop applying the term "parapsidal line" to the structure otherwise called the **notaulus**. The story is not complete enough, however, to force me to apply it to the alternative structure in the wasp mesonotum.

The reason is that the term "parapsidal line" and its equivalents have been widely applied, and are still in wide use, in reference to what hymenopterists call the **notaulus**. Arnold cites a few examples; here are several more: Handlirsch (1933: Fig. 971); Weber (1933: p. 144 and Figs. 128a, 157, 182c); Badonnel (1934: p. 111 and Fig. 42); Keler (1963: p. 469, Pl. 30, Fig. 8); Rasnitsyn (1969, p. 103 and Fig. 173; 1975, Figs. 125, 126); Jacobs and Seidel (1975: p. 266, Fig. 440), Steinmann and Zombori (1981: Fig. 200); Brodsky (1991, 1992, throughout). The list can be enlarged.

The term "parapsidal line" is thus confusing. In the higher hymenopterans (suborder Vespina) it is generally applied to the external indication of the initial attachment of the tergopleural muscle (indirect wing levator). In other insects (including the lower hymenopterans, the suborder Siricina), which lack this external indication, the term is commonly used to denote another structure, the line or suture separating the attachment areas of the above mentioned muscle and the medial dorsal longitudinal one (indirect wing depressor).

In my opinion, the present practice in using the term parapsidal line perpetuates the confusion and should be abandoned. I propose in particular to abandon the term, at least concerning the hymenopterous insects. Instead I propose to introduce a new term to denote the site of primary attachment of the indirect wing levator.

Alternative terms for the above structure are already exist. These are "sekundare Parapsiden"[1] (Weber 1933: Fig. 157) or "sekundare Parapsidenfurchen" (Keler 1963: 469, etc.), ("secondary parapsis/parapsidal furrow" in English), "additional suture" (Rasnitsyn 1969: 103), "lateral longitudinal suture" (Rasnitsyn 1975: Fig. 125, 126), "additional lateral suture" (Rasnitsyn 1980: 62), "lateral scutal lines" (Rasnitsyn 1988: 123), or "additional parapsidal suture" (Brodsky 1992: 52, Fig. 15).

None of the above terms is well established, and none do I like. That is why I propose to use a new one, the **adlateral line**, coined by Eduardas Budrys in his unpublished thesis as a twin term of the admedial line. The latter also denotes a scar at the site of the primary muscle attachment, particularly the indirect wing depressor (Daly 1964).

Literature cited

Badonnel, A. 1934. Recherches sur l'anatomie des psoques. Bulletin biologique de France at de Belgique, Supplement XVIII. Le presses universitaires de France, Paris. 241 p.

Brodsky, A.K. 1991. Structure, functioning and evolution of tergum in alate insects. I. Generalized scheme of structure. Entomologicheskoye obozrenie 70:297-315. (in Russian, translated into English in Entomological Review 70(9):64-82)

_____ 1992. Structure, functioning and evolution of tergum in alate insects. II. Peculiarities of organization of a wing-bearing tergal plate in insects of different orders. Entomologicheskoye obozrenie 71:39-59. (in Russian, translated into English in Entomological Review 71(9):20-28)

Daly, H., 1964. Skeleto-muscular morphogenesis of the thorax and wings of the honey bee *Apis mellifera*. Univ. Calif. Publ. Ent. 39:1-77.

Handlirsch, A. 1933. 17. Ordnung der Pterygogenea: Hymenoptera = Hautflugler. In: W. Kukenthal (ed.) Handbuch der Zoologie. 4/2 Insecta 2. Walter de Gruyter, Berlin und Leipzig. P. 895-1036.

Jacobs, W. and F. Seidel, 1975. Worterbucher der Biologie. Systematische Zoologie: Insekten. Gustav Fischer Verlag, Jena. 377 p.

Keler, S., von, 1963. Entomologisches Worterbuch. Akademie Verlag, Berlin. XVI+774 p. + 33 pl.

Rasnitsyn, A.P., 1969. Origin and evolution of lower Hymenoptera. Transactions of the Paleontological Institute, Academy of Sciences of the U.S.S.R. 123. Nauka Press, Moscow: 196 pp. (in Russian)

_____ 1975. Hymenoptera Apocrita of Mesozoic. Transactions of the Paleontological Institute, Academy of Sciences of the U.S.S.R. 147. Nauka Press, Moscow: 134 pp. (in Russian)

_____ 1980. Origin and evolution of Hymenoptera. Trans. Paleontol. Inst. Acad. Sci. USSR. 174. Nauka Press, Moscow. 192 p. (in Russian)

_____ 1988. An outline of evolution of the hymenopterous insects (order Vespida). Oriental Insects 22:115-145.

Steinmann, H and L. Zombori, 1981. An atlas of insect morphology. Akademia Kiado, Budapest. 248 p.

Weber, H. 1933. Lehrbuch der Zoologie. Gustav Fischer, Jena. 726 p.

[1]Weber incorrectly used Parapsiden as a synonym of Parapsidalleisten (e.g. p. 144), and so did I (e.g. Rasnitsyn 1969: 103, etc.).

On Budrys' Line (response to Budrys and Rasnitsyn)

I agree with Eduardas that personal opinion and local tradition play strong roles in determining term usage, just as they do with a lot of other things. In my essay I attempted to illustrate modern usage of the terms notauli and parapsidal lines by citing only major publications, which by virtue of their comprehensiveness, will likely have the most influence on subsequent generations of taxonomists. Obviously my literature survey was not exhaustive.

Contrary to Eduardas' comments, contemporary usage of notaulus and parapsidal line sensu Emery 1900, Morley 1903 and Tulloch 1929 is not confined mainly to "Americans" (I suppose he means scientists in the USA). If a tally is made of the 15 works that I cited, only 7 were authored by people in the USA. The 8 remaining works represent authors in Europe, Australia and Canada. I suppose one could argue that Canadians are "Americans", but I presume that they prefer to be known as Canadians.

Because of the historic duplicity of usage of the old term parapsidal line, Eduardas proposes a new term, **adlateral line** for parapsidal line sensu Emery. This new term will probably only muddle usage further, for as Eduardas suggests, people do what they want. Perhaps his east European colleagues will adopt adlateral line while the rest of the world uses parapsidal line one way or another. Because it is shorter than parapsidal line, I admit that adlateral line has appeal. But **Budrys line** is even shorter! Why not call it Budrys line?

In his title and opening paragraph Eduardas uses the **area** term parapsides and equates it with linear grooves that Schmiedeknecht called "Parapsidenfurchen". I think he intended to use parapsidal furrow instead.

Alex adds more examples of modern authors that have used parapsidal line sensu Mayr 1887 in an attempt to show, I suppose, that my presentation was biased in favor of parapsidal line sensu Emery 1900. Some of his examples are from outside the order Hymenoptera and likely will have less influence. Nonetheless, he has demonstrated that usage of the term parapsidal line is inconsistant. It will be interesting to see how future taxonomists deal with parapsidal line/adlateral line.

The parapsidal line wars are somewhat analagous to the recent change in scientific names of the common European paper wasp, *Polistes dominulus* (Christ) (= *gallicus* of authors, not Linnaeus). When this change was made by Mick Day in 1979 (see **Sphecos** 12: 21), there were scientists who objected strenuously on sentimental grounds; some even suggested that the ICZN be petitioned for conservation of *gallicus* sensu traditional usage. I was rather amazed therefore, to see that most contemporary workers quickly adopted the name *dominulus* in their publications. I guess science is finally winning out over sentimentality!

Arnold Menke

Remarks on Parapsidial Lines in Scollids

by

Till Osten
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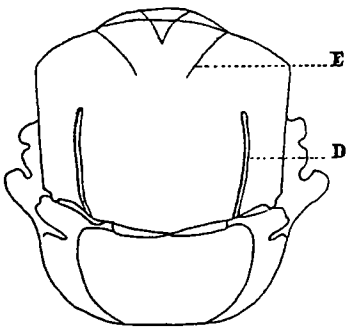
Arnold Menke refers in **Sphecos** 24 very clearly to the different opinions or definitions of parapsidial lines and notauli. I am sure that in the field of morphology (not just in insects) there exist a number of similar variations in termi-



Mesonotum and Scutellum from *Scolia*, fig. 12 from Betrem, 1928:
E: "Echte" Parapsidenfurchen
D: "Falsche" Parapsidenfurchen

nology. This confusion is quite often the reason for dreadful misunderstandings. "Citius emergit veritas ex errore quam ex confusione." This sentence is the introduction to Willi Hennig's "Grundzuge einer Theorie der phylogenetischen Systematik", Berlin,1950.

To add another opinion on parapsidial lines, I want to discuss the concept of J.G. Betrem (1928:16-17) in reference to scoliids. He distinguished between "echten", right, (=**notauli**) and "falschen", wrong, (=**parapsidial lines**) Parapsidenfurchen. "Echte" parapsidial lines in the sense of Betrem are the only ones that correspond to muscle attachments (flight muscles). The investigations of Betrem and also of myself show that the "echte" parapsidial lines, notauli, are not visible in all scoliids. Betrem says the "falsche" parapsidial lines in scoliids are not homologous with structures found in other insect groups, but he does not give an explanation for this opinion. I believe that what are called parapsidial lines are homologous at least within the Hymenoptera, following the ideas of Arnold.

Literature cited

Betrem, J.G. 1928. Monographie der indo-australischen Scoliiden (Hym. Acul.) mit zoogeographischen Betrachtungen. Treubia 9(Suppl.):1-388.

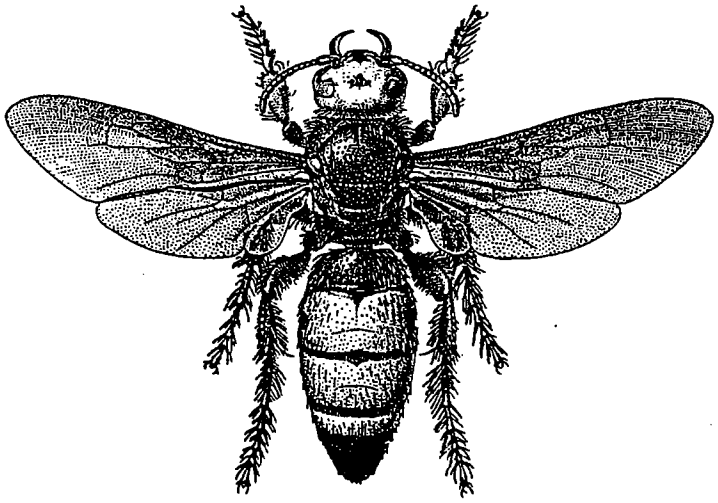
On Betrem's Furrows (response to Osten)

Betrem (1972:16) reversed his 1928 scutal groove terminology noted by Till Osten. In this much more recent paper Betrem uses "parapsidal furrows" for the "deep" grooves that arise from the "posterior margin" of the scutum. He says that the areas lateral to the parapsidal furrows are the parapsides. Betrem says the "weak suture anteriorly on each side" of the scutum is the "prescutal" suture. Presumably, notaulus is synonymous with prescutal suture.

Arnold Menke

Literature cited

Betrem, J.G. (with collaboration of J.C. Bradley), 1972. The African Camposomerinae (Hymenoptera, Scoliidae). Monogr. Nederlandse Ent. Vereniging, No. 6, 326 p.



Scolia flaviceps mangichlakensis Radoszkowski

PET PEEVE

Species Identification Labels

As a museum curator, I routinely have to deal with putting away material returned by borrowers. I find on average that about half of the borrowers place their own identification labels on EACH specimen. The remaining workers only put a species identification label on the first specimen of a series, or on the first and last specimens of a series. Occasionally I have received borrowed material where the scientist (?) has used existing determination labels of a previous worker for his own! In other words there is nothing on the material that indicates it was studied by the latest revisor of the group!

The bottom line here is that if a specimen does not bear your label, you have done our science a great disservice. You may have spent months or even years revising a difficult group. Some species may be extremely difficult to identify, even by the specialist. Thus, at the end of this research, if you don't label every specimen, part of your research time, in a very real sense, will have been wasted. You will not have left behind a voucher specimen database. Think about it.

Nowadays computers make production of identification labels easy and quick. Granted, it does take time to cut them up and place one on each specimen, but this is an essential part of our research.

Another problem in lending material to researchers is that some specimens already have identification labels. Often the revisor will find that these labels are erroneous for various reasons (synonymy, misidentifications, etc.). Such labels should be removed from the pin, folded in half, then repinned on the specimen so that their erroneous information is not readily visible. Failure to do so will lead to future confusion, especially if a current identification label has not been placed on the pin beneath the older label. Some would argue that old erroneous identification labels should simply be removed and discarded. There may be historical reasons for keeping old determination labels however, and generally I simply conceal their data by folding them and repinning them.

Arnold Menke

SCIENTIFIC NOTES

Nests and Prey of *Crabro monticola* (Hymenoptera: Sphecidae)

by
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Crabro monticola (Packard) is a common species of digger wasp, widespread in eastern North America (Maine and Ontario southward to Georgia, westward to Minnesota and Arkansas) (Bohart, 1976). It apparently nests primarily in firm but sandy soil, such as in sand pits, paths and roadways. Entrances of its nests are often surrounded by a conspicuous tumulus, and nests may occur in large aggregations. Because *C. monticola* is an unusually large and conspicuous crabronine, there have been several reports on its nesting behavior, e.g., Evans (1960), Alcock (1982), Evans, Kurczewski and Alcock (1980) and Pechuman (1963).

We had an opportunity to observe some details of the behavior of this wasp and its nest structure near Mountain Lake Biological Station, Giles County, Virginia in late July and early August 1992. Nests were discovered along the edge of an unpaved road about 4.3 km. northeast of the north end of Mountain Lake, at an elevation of approximately 1100 m. Most nests were in the narrow shoulder of the road, in compact sand, and a few were actually in the road. The road at this site was essentially level and was bordered on both sides by second-growth forest, primarily of oaks, that shaded the nest area except for about five hours in the middle of the day.

On 26 July, we found 14 nests (12 open, 2 plugged with loose sand) along 13 meters of the roadside. By 29 July 21 nests were found and marked, within this same narrow zone; and by 5 August 25 nests were evident, of which 4 showed no signs of activity by the wasps. On 12 August, we found that the road had just been graded, obliterating all but two nests and their markers. We poured plaster-of-Paris into these two remaining burrows and a short time later excavated the nests.

[1]Copies of this paper may be requested from the first author, Snow Entomological Museum, Snow Hall, University of Kansas, Lawrence, Kansas 66045-2119, U.S.A.

The excavated nest burrows were short, the first only 18.7 cm. long, terminating 11.2 cm. below the surface, and the second 14.5 cm. long, ending only 9.3 cm. from the surface. These are considerably shorter than those reported by Evans (1960), who found burrows about 35 to 40 cm. in length but at such an angle to the surface that the brood cells were at a depth of only 7.5 to 17.5 cm. On excavating the nests, we found that the soil became abruptly more compact (in fact, quite hard) just below the levels at which the burrows terminated.

Relatively new brood cells (i.e., without evidence of feeding by a wasp larva) contained 3 or 4 tabanid flies (those with 4 possibly for rearing females and those with 3 for the smaller males). Flies in all cells were apparently paralyzed, showing no signs of desiccation or decomposition (cf. "killed at the time of capture" – Evans, 1960). The wasp's egg was in each case attached transversely between the head and prothorax on the ventral side, i.e., across the fly's neck.

In one of our excavated nests, the two cells farthest from the entrance (and 120 and 165 mm. below the surface) contained small, perhaps half grown larvae of *Crabro*. One of these cells contained four tabanid flies, some damaged by larval feeding. From the other, only one fly was recovered. Three cells nearer the entrance (92, 92 and 75 mm. from ground surface) contained respectively four, three and four flies, with a wasp egg attached to one fly in each cell. These findings agree with those of Evans (1960), that is, that a female *Crabro* excavates a burrow, then completes and provisions cells in sequence from those farthest from the entrance to those nearest. Approximately 10 mm. below the termination of the burrow (as indicated by the plaster), five intact tabanids were recovered with neither larva nor egg of *Crabro*. Possibly this was a temporary prey-storage area. Our second excavated nest had only two cells, one containing fragments of four flies and an apparently mature larva of *C. monticola*, and the other a few fragments of prey and a bombyliid larva.

Many female wasps were marked with different colors of paint in order to determine whether there was any nest-sharing. Three instances were recorded of two females entering the same nest, and twice nestsharing by three females was observed. At one nest, four female wasps entered within 40 minutes, three of the four carrying prey. Since it is the usual behavior of *Crabro monticola* to enter its burrow rapidly, even when transporting prey (Evans, 1960), we placed small, clear-plastic cups over nest entrances to delay entry and exit briefly. The wasps were seen to use their hind legs to hold their prey and to carry the flies dorsal side up. Both these observations contrast with those of *C. advena*, which grips the prey (again tabanids) with the middle legs and transports it venter-up (Evans, 1960: 124). One of us (GWB) captured a wasp carrying its tabanid prey venter-up.

Several kinds of flies, particularly Tabanidae, have been recorded as brood-cell provisions, or prey, of *Crabro monticola*. Evans (1960) listed *Tabanus lasiophthalmus* Macquart (now *Hybomitra lasiophthalma*), *Tabanus microcephalus* Osten Sacken (now *Hybomitra microcephala*), *Chrysops celer* (Osten Sacken) (now *C. cincticornis* Walker) and *Stonemyia tranquilla* (Osten Sacken), all Tabanidae, and *Thereva* sp. (Therevidae), from Connecticut and Maine. Pechuman (1963) identified *S. tranquilla* and *Chrysops venus* Philip as prey of *C. monticola* in the Parry Sound region of southern Ontario. Evans et al. (1980) added *Chrysops geminatus* Wiedemann, *Hybomitra sodalis* (Williston), *Thereva frontalis* Say, *Eristalis arbustorum* (Linnaeus) (Syrphidae), and two species of Calliphoridae, *Pollenia rudis* (Fabricius) and *Phormia regina* (Meigen), from various localities. Alcock (1982) recorded as prey, at Lake Itasca, Minnesota, "primarily Tabanidae; a few syrphids and tachinids."

At the Mountain Lake site, all prey brought to nests appeared to be males of *Goniops chrysocoma* (Osten Sacken), a primitive pangoniine tabanid. All prey from excavated cells were also males of this rather uncommon species. *Goniops chrysocoma* has a wide range, from southern Ontario southward to South Carolina and westward to Arkansas, but within this area it has only occasionally been collected. Females of *G. chrysocoma* are not known to feed on any vertebrate host, and males, unlike those of some tabanids, are rarely found associated with flowers. McAtee (1911), in a paper on the life history of *G. chrysocoma*, did not mention feeding by either the female or male flies. One of us (GWB) has collected insects

during 21 summers in the Mountain Lake vicinity and has from time to time found females of *Goniops chrysocoma* guarding their egg-masses on the undersides of leaves but has only rarely taken a male. It is clear that females of *Crabro monticola* are hunting their prey in some particular habitat to which males of *Goniops* are differentially attracted. Other tabanids of similar size (*Chrysops* species) were active in the forest at the time of these observations but were not being utilized by *C. monticola*.

Helen Court sent (to GWB) three females of *C. monticola* from the collection of the California Academy of Sciences, each wasp pinned with its prey. These insects were captured by F. X. Williams in the Blue Hills (Norfolk Co., at the southern edge of Milton, a suburb of Boston), Massachusetts, on 13 August 1913. The flies have been identified (by GWB) as *Stonemyia rasa* (Loew) (Tabanidae; two males pinned with one Crabro) and *Tolmerus sadyates* (Walker) (Asilidae; one male, one female). This is the first record of Asilidae as prey of *C. monticola*.

Alcock (1982) saw several instances of nest usurpation in *Crabro monticola*, as many as six females sequentially provisioning a particular nest during a 26-day period. But usurpation, he found, never resulted in joint occupation of a burrow. In fact, it appeared that females sometimes abandoned their nests because another female had entered the nest while the provisioner was away. Accordingly, our observation that four different females entered a single nest within 40 minutes, three of them transporting prey, is difficult to understand.

Acknowledgments

We thank Helen Court, of the California Academy of Sciences, for confirming our identification of *Crabro monticola* and for providing additional prey records, Dr. Henry M. Wilbur, Director of Mountain Lake Biological Station (University of Virginia), for making transportation and laboratory facilities available to us during the period of our field observations, and Byron Alexander and Frank Kurczewski for helpful suggestions for improvement of this paper.

Literature Cited

Alcock, J. 1982. Nest usurpation and sequential nest occupation in the digger wasp *Crabro monticola* (Hymenoptera: Sphecidae). Canadian J. Zool. 60: 921-925.

Bohart, R. M. 1976. A review of the nearctic species of *Crabro* (Hymenoptera: Sphecidae). Trans. Amer. Entomol. Soc. 102:229-287.

Evans, H. E. 1960. Observations on the nesting behavior of three species of the genus *Crabro* (Hymenoptera, Sphecidae). J. New York Entomol. Soc. 68:123-134.

Evans, H. E., F. E. Kurczewski and J. Alcock. 1980. Observations on the nesting behavior of seven species of *Crabro* (Hymenoptera, Sphecidae). J. Natur. Hist. 14:865-882.

McAtee, W. L. 1911. Facts in the life history of *Goniops chrysocoma*. Proc. Entomol. Soc. Washington 13:21-29.

Pechuman, L. L. 1963. Another record of Tabanidae as prey of *Crabro monticola* (Packard) (Hymenoptera: Sphecidae). J. New York Entomol. Soc. 71:218-219.

Observations on Wasps in Florida

by

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[The following notes are extracted and rewritten from a talk given by the late Erik Tetens Nielsen in February 1989. He passed away before he completed his studies - edit.]

Sphex jamaicensis (Drury)

As reported in **Sphecos** 17:3 I observed a large colony of these beautiful wasps nesting in an old dike on South Beach near Fort Pierce in 1987. My superficial observations revealed a number of differences between this wasp and some of the better studied species of *Sphex*. For example, *jamaicensis* is a progressive provisioner, a trait heretofore known in only the Oriental species *subtruncatus*. Dahlbom (see Krombein 1984). The colony found in 1988 occupied an area about 6x10m^2 on the dike, but marked individuals established a new site on the dike. In a week or two the new colony was fully developed. During the time of observation, August-November, 1988, the colony occupied four different sites on the dike. In my experience such colony movement is atypical of colonial wasps. Colonies tend to remain in the same place year after year. In Denmark, for example, a colony of *Bembix rostrata* (Linnaeus) that I studied remained in one place for twenty years, moving only slightly when the nest site was disturbed by plowing. I revisited the *jamaicensis* colony sites in mid December and was surprised to see that the wasps were still active and in fact had formed a fifth colony. Two nests contained wasp larvae and newly caught tree-crickets [probably Tettigoniidae, *Conocephalus* sp.]. Other nests dug up contained wasp cocoons.

The first time I visited the site was August 11, 1987 and only females were observed. Obviously males had appeared earlier, mated, and died. The females seen August 11 were at least one week old. They lived at least 4 and a half months, an amazingly long time for a wasp. In 1988 a June visit to the site revealed large numbers of males flying in circles over the colony, about 10-20 cm above the surface. There were even a few females which were trying to make nests, but they were perpetually interrupted by males who would not take NO for an answer. During the following week the number of females increased and by the first of July nearly the whole dike seemed to be a seething mass of these large wasps. The males died away during the first week of July as expected. But the female population was declining also, and by August 11, 1988, a year after my first observations, there were only a few left. Most of the females had left to make a colony at another place.

The Tube-Dwellers:

I'm sorry I am not a Muslim. If I had been, after my stoke, I would undoubtedly have received special training to be able to perform the prayers five times a day including the exercises. That would have made it much easier for me to study ground nesting wasps such as *Sphex jamaicensis*. To observe them properly you have to lie outstretched on your belly so that you can look them in the eye. So after my stroke I decided to study other Hymenoptera with whom I could communicate in a sufficiently intimate way without doing gymnastics. So I took up the study of bees and wasps that utilize pre-existing cavities such as hollow stems of bramble or elder, or the galleries of wood-boring beetles. The French call them "rubicolles" (of *Rubus*, bramble). The Germans call them "Linienbauten" because the chambers are

in a line. The Americans call them trap-nesters for unknown reasons. I would rather call them tube-dwellers because that is what they are.

In studying the tube-dwellers in Florida I have had the advantage of being able to utilize the great 1967 book *Trap Nesting Wasps and Bees* by Karl Krombein, senior hymenopterist at the Smithsonian. He set out tubes drilled in wood at various places, one of which was the Archbold Station. His book represents observations of 75 species from no less than 3700 nests. How did I dare to take up the study of animals so well known? Well, for one thing, Krombein is a museum-man, but I am an experimantal biologist; I want to shake hands with the animals, and just because the elementary work has been so excellently done by Krombein, I think I may be able to study the animals in a more experimental-ethological way. I daresay, however, that I would never have gotten as much out of this year's work [1988] without having Krombein's "bible" for consultation.

I made a "house" with a roof of bamboo tubes over a clay wall. The house rested on bricks in a dish of water to prevent invasion by ants. I made the clay wall hoping that tube-dwellers could make use of it in their nest building, but only the large, beautiful vespid, *Monobia quadridens* (Linnaeus) availed itself of the soil supply, and it carried it elsewhere since my tubes were too small. Early in May 1988 the first wasps arrived. These were vespids, one species of which was identified by Krombein as *Euodynerus hidalgo boreoorientalis* (Bequaert). I opened the first nest completed by *hidalgo* and found to my surprise that the wasp had only used the outer half of the tube. The wasp began her nest with a rather thick wall in the middle of the tube, and then built 5 chambers which took all the space to the end of the tube. There was no vestibular cell. Usually there is an empty space between the outer most chamber and the entrance which Krombein called the vestibular cell. I have never seen a nest without it and Krombein says this situation is very rare. The second nest contructed by this wasp started at the far end of the tube and contained 5 chambers. It had an unusually long vestibular cell. The third and fourth nests constructed by this wasp were in shorter tubes and the vestibular cell was of normal length. The female spent each night in the tube. She does this by backing into the tube, just as she does when depositing an egg. In the morning the female would come to the nest opening. Usually she retreated into the tube, remaining there 50 minutes before departing on the first trip of the day.

In July and August there were so many users of the tubes that it was impossible for me to keep track of them [Erik by then had a much larger tube facility than the one described earlier]. Sphecidae was by far the largest user group. One was *Podium rufipes*, (Fabricius), sneaking around, trying all the tubes, and not flying much. It uses wood-roaches for its larvae and the walls are made of pieces of organic matter held together by resin. The *Podium* does not seem to make a nest for itself, but makes a single cell in the nest of other wasps. At least I have always found their chambers between those of others. Twice, I found cell contents of wood-roaches thrown out by the rightful owner.

From Goethe's Faust we know that all German witches gather on Brocken in Harzen to celebrate Walpurgis night, May 1. The Danish witches find it a little too cold so early in the year and celebrate midsummernight instead. You know that witches travel by riding broomsticks. The summer of 1988 was the first time I witnessed this phenomenon. The afternoon of August 14 she came sailing into my view; she was small, about the size of a fairly large wasp, and the broomstick was very much longer than I expected, maybe 6 times her body length. This was my first meeting with *Isodontia mexicana* (Saussure). I followed an *Isodontia* female during her construction of 4 nests, and learned a couple of important things. First the straw-like material was obtained from palm fronds (this I learned from my friend Gilles Parbeau). The first day of a new nest a considerable time is spent collecting these straws which are woven together into a firm cushion near the center of the tube. One opening is left on the side through which the wasp can pass with tree-cricket prey [Tettigoniidae, probably *Conocephalus* sp., det. David Nickle]. The back room is the brood chamber in which two or three adult female tree-crickets are deposited without walls between them. Each egg is laid right behind the left foreleg. When the eggs hatch, and the first prey item is consumed, more are brought in for the developing wasp larvae. During this period very little is seen of the mother wasp, but after 5-6 days, she again begins to gather straws with which she fills up the empty room outside the straw cushion. This closes the brood chamber. The outer room is filled up with all kinds of straw and a number of them hang outside the completed nest.

You might ask, how did I know what goes on inside the closed section of the nest? Well I put a rubber stopper in one end of the open tube of nest number two. After a couple of days I opened it and pulled the three crickets out with their wasp eggs and closed the tube again. Only one egg hatched but the larva eventually died. More interesting is that the mother wasp did not carry in more food, but after a short while closed the nest as usual. Possibly hungry larvae signal the mother that more food is needed. This needs further study.

By far the most dominant species in my roof during the summer of 1988 was *Trypargilum lactitarse* (Saussure) [det. Krombein]. This medium sized wasp is immediately recognizable by its white socks on the hind feet. It is related to my old friend *Trypoxylon figulus* (Linnaeus), a species I knew so well in my youth in Denmark. I was able confirm the observation of Rau (1928) and others, that in *Trypargilum* the male sits in the nest awaiting the arrival the female. When she arrives he often comes out to meet her, but I never saw the male take the burden from the female. While they are hanging at the underside of the nest entrance the male frequently tries to mate with the female, and is often successful. In some cases, they enter the tube partly united and disappear inside. I have also seen a female copulate with a male on the table under the tubes, during which another male flew into her nest. Copulation completed, she then entered the nest. In this genus males appear to live as long or longer than females. In the fall of 1988 females were last seen in October, but the last male was still watching a nest until early November.

Another remarkable thing in the genus *Trypargilum* has to do with sound. It is well known that many wasps emit short, hissing sounds when they work. Such sound is produced by *Bembix* and *Sphex jamaicensis* when digging, and is almost certainly produced by the wing muscles. In *Bembix* I believed that I could distinguish differences in sounds produced because of a hindrance to

work, or to satisfaction with work. I wanted to take photographs of a *Bembix* carrying a stone from the nest. So I placed a stone in the nest entrance and took a photograph as the wasp carried away the stone. To be sure I got it right, I repeated this several times. The third time she became agitated and carried the stone a long way from the nest while giving off an unusual long and loud series of sounds. They sounded to me like very foul language. When studying tube-dweller nests I insert a thin stick to follow the progress of the nest. This method cannot be used in *Trypargilum* with a guarding male. It feels like an electric shock and he may continue for more than a minute complaining over the disturbance. But that is nothing compared to the conversations between husband and wife.

Literature cited

Krombein, K. V., 1984. Biosystematic studies of Ceylonese wasps, XII: Behavioral and life history notes on some Sphecidae (Hymenoptera: Sphecoidea). Smithsonian Contrib. Zool. (387): 1-30.

Rau, P., 1928. Field studies in the behavior of the non-social wasps. Trans. St. Louis Acad. Sci. 25:325-489.

Addendum to Note on a Stridulating Sphecid (Sphecos 24)

by

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After **Sphecos** 24 was at the printers I visited the British Museum (Natural History) and examined specimens of *Pterygorytes triangulatus* Sm. This species, like the species from Colombia, also has the hind wing jugal lobe well-developed.

My note in **Sphecos** 24 may have given the impression that only females of *Tanyoprymnus* and *Ammatomus* have a stridulatory organ. I can confirm that males of the species of these genera represented in the B.M. also have a stridulatory organ.

Further records of *Pison* mainly from Guanacaste Province, Costa Rica

by

Arnold S. Menke

Unless specified otherwise, the following records are from material collected by Frank Parker and deposited in the collection of the Bee Biology and Systematics Lab., Utah State Univ., Logan, Utah.

Pison cameronii Kohl

Finca Montezuma (3 km SE Rio Naranjo), 11-18 September 1992, 1-11June 1992, 2 females; Alajuela Prov.: Bijagua, 20 km S Upala, 17 July 1992, one female, 29 July-26 August 1991, one male.

The male is somewhat atypical. Flagellomere II has a weakly formed welt-like tyloid in addition to the normal ones found on III-VI. The OOD is 0.66X the HOD. The UID is 0.74X the LID. The genitalia and sternum VIII agree with figures 215-220 in Menke (1988) except that the volsellar form is quite different and the midventral lobe of the gonostyle is slightly different.

Pison conforme Smith

Finca Montezuma (3 km SE Rio Naranjo), 10-23 January 1992, 15-24 February 1992, 10-15 June 1992, 17-29 July 1992, 10-26 August 1992, 18-28 November 1991, 4-18 December 1992, 6 females, 5 males.

Pison cressoni Rohwer

Finca Montezuma (3 km SE Rio Naranjo), 18-28 December 1992, one female.

The gaster is entirely black; none of the terga have creamy apical bands.

Pison eu Menke

Finca Montezuma (3 km SE Rio Naranjo), 27-31 May 1992, 17 July 1992, 10-26 August 1992, 3 females.

The upper interocular distance in these specimens ranges from 0.78 to 0.80 X the lower interocular distance. The lower lip of the clypeal lobe is weakly or not indented.

Pison gnythos Menke

Alajuela Prov.: Bijagua (20 km S Upala), 1-11 June 1991, one female.

This specimen agrees with earlier comments that I made on specimens from this locality (Menke, 1992).

Pison krombeini Menke

Estacion Experimental Enrique Jimenez Nuñez (14 km SW Cañas), 1-22 June 1991, one female.

Pison longicorne Menke

Finca Montezuma (3 km SE Rio Naranjo), 24-29 January, 1993, April, 1992, 10-15 June, 1992, 17 July, 1992, 11 September – 9 October, 1992, 7 females.

Pison pilosum Smith

Finca Montezuma, (3 km SE Rio Naranjo), 1 May 1992, 14-18 March 1992, 5-10 April 1992, 10 May 1992, 18-28 November 1991, December 1991, 5 females, 1 male; Estacion Experimental Enrique Jimenez Nuñez (14 km SW Cañas), 8-15 February 1991, 1-7 March 1991, 23 June-15 July 1991, 5 females.

Pison conforme Smith from Ecuador

This species is a common Central American wasp, but records in South America are scarce (Menke, 1988). I can add the following Ecuadorian record based on material in the Bee Biology and Systematics Lab., Utah State University, Logan, Utah.

Pinchincha: E. Santo Domingo, 6-12, May 1990, W. J. Hanson, 2 females.

Literature cited

Menke, A.S. 1988. *Pison* in the New World: a revision (Hymenoptera: Sphecidae: Trypoxylini). Contrib. Amer. Ent. Soc. 24(3):1-171.

_____ 1992. *Pison* in Costa Rica (Sphecidae). Sphecos (23):8-10.

Mating Flights of *Campsomeris plumipes* (Drury) at Weymouth Woods, North Carolina (Scoliidae)

by

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The Scoliid wasp *Campsomeris plumipes* is one of the common wasps at the Weymouth Woods Sandhills Nature Preserve in Moore County, east of Southern Pines, North Carolina. The Sandhills Region, covering one million acres in south central North Carolina, is a subdivision of the Atlantic Coastal Plain. Flat-topped sandy ridges separated by broad level valleys make this area unique. Extensive longleaf pine forests once covered the area, but at the present time there are only scattered surviving remnants.

This Pine Barrens Preserve was established in 1963 on 425 acres of longleaf pine forest donated to the state by Mrs. James Boyd, wife of a noted North Carolina author. Later this was expanded to 657 acres. Its purpose was to preserve and protect some of the specially adapted plant and animal communities of the Sandhills Region – notably those of the longleaf pine forest. Many of these plants and animals are dependent upon recurring fires. While the Red-cockaded Woodpecker is the best known member of this community, the sandy soil and controlled burning are an important factor in providing extensive populations of many insects, particularly of species of Hymenoptera, including *Campsomeris plumipes*.

The mating flights of this wasp are frequently a conspicuous feature in the spring and again in mid-summer. Having noted these flights for the past fourteen years, I've become aware of some distinct patterns. The major part of the flights occur in a definite section, an area roughly 40 by 45 feet with pine straw covering white sand, and no grasses or low vegetation. Five longleaf pines occur in the area. The wasps fly 1 to 2 inches above the ground, and a major flight may include from 2 or 3 dozen wasps to several hundred in a really big flight. They generally prefer the sunny areas. At times females as well as males have been noted in the flight.

Normally the flights occur in the morning hours, although both these rules of time and place were broken in '79, the year when I first noted their occurrence. At that time – it was 2 p.m. on April 10 – a big flight was seen over recently burned pine straw, some 26 feet to the right of the main building. (What became the established flight ground was 15 feet to the left of the building.) On April 11 no wasps were to be seen until noon, and then only a few were in flight. This seems to be typical. The concentration comes on marked days, and the sudden drops can't be explained by adverse weather conditions. Often a big flight over the main area will be preceded by scattered flights over the nearby lawn and trails, and quite often a big flight is followed by a day or two of inactivity. In '79 another big flight of at least 100 wasps was in full swing by 12:30 p.m. By April 30, no wasps were to be seen.

More flights of several hundred wasps were seen on June 26, June 28 and July 3. I didn't note the exact time, but they took place between 9:30 and 11:30. The flights now were over the lawn and brick walks immediately in front of the building, and between the burned area and what became the normal flight ground.

There was a major flight at 2 p.m. on March 31, 1980. May again provided a big gap with very few in flight, but by mid-summer we had tremendous flights again. '81 gave us the usual big flights in spring and mid-summer. In '82 there were no noticeable flights in the spring, and I failed to pick up any in the summer, but one ranger thought we had the normal ones. All were in what had become the usual flight ground.

By the summer of '83, I decided upon more careful notes. The big flights then occurred from Aug. 4 through 16, the biggest one being on the 12th. On the 4th the wasps were in full flight by 9:50. It was over by 10:30. Full flight on the 8th was at 8:50, on the 9th at 9:15, and on the 10th at 9:10 (this was over at 10:35). On the 11th full flight was at 11:15, and on the 16th at 9:00. The last wasp for the year was seen Sept. 4. The last sightings are generally some time in September.

In '84, there were flights from Apr. 14 to 16, the biggest on the 16th at 10:20. On Apr. 27 there was another flight, while a big drop occurred in May. On July 19, flights occurred over sandy areas and sidewalks. From Aug. 2 to 25, good flights occurred on the main flight ground, principally on 2, 8, 22, and 25.

In '85, no notes were taken in the spring. A big flight occurred on July 18 from 10:00 to 10:30.

In '86, big flights occurred March 30 and April 6 while fair flights occurred April 27 and May 6. That on the 27th was quite spread out over the flight ground, lawn and trails. In July quite a few wasps were patrolling the lawn. This behavior is usually preliminary to a flight. It occurred on Aug.6.

In '87, a few wasps were in flight on Apr. 8 and 14. A controlled burn probably disrupted any main flight. On June 28, a conspicuous flight occurred along the driveway, not on the flight ground. On July 16 a tremendous flight occurred on the usual ground. There was quite a good flight in early August, but no wasps were seen from mid-August on.

In '88, we had another enormous concentration on the flight ground in early April. A good number were seen on July 26 and even as late as Aug. 29.

In '89, a big flight occurred on March 18, mostly on the flight ground, but also spreading out into the surrounding woods and lawn. In July, some wasps were seen, but no big flight.

'90 gave us wasp flights on March 16 and 18, but we saw none later that.

In '91, there was a good flight on March 23 and a fair one on July 29.

In '92, there was another fair flight on March 11. On July 23, a good flight occurred near the flight ground, not over it. This was the first real flight of the year.

I've included all of this data to show there is a variation in time and place, although it's not too great. We've noted mating on only five occasions. Four of these were reported by the rangers; one I watched. In each case a little ball was formed as three or four males tried to mate with one female. When I observed this, quite a number of males were flying in a very agitated manner above the ball on the ground. We thought this indicated a shortage of females, and I was interested in J. Chester Bradley's (1928) comments on thismatter. He said: "Anyone with field experience in the vicinity, let us say of Philadelphia or New York, knows that the males of *plumipes* are extremely common insects, but that the females are very seldom met with. As boys collecting in the pine barrens of New Jersey, we used to consider them as real rarities, and I have often wondered why there should be such a disparity between the sexes. It is equally true that farther south, let us say in Georgia and Florida, no such disparity exists. One can collect there quantities of what pass for females of *plumipes*. I have long

suspected that this biological distinction might point to other differences between the northern and southern forms, and such is, in fact, the case."

Bradley (1928) recognized three subspecies of *plumipes*: *plumipes plumipes* (Drury) in the northeastern part of the United States, *plumipes fossulana* (Fab.) in the south, and *plumipes confluenta* (Say) in the Great Plains. He pointed out an obvious structural distinction between the majority of the females, stating that while there is no intergradation where the ranges of *plumipes* and *fossulana* meet in North Carolina, there is such intergradation between *confluenta* and *plumipes* in Ohio, and *confluenta* and *fossulana* in Kansas. C. S. Brimley (1938) said that *C. plumipes plumipes* was state-wide (in North Carolina), while *C. plumipes fossulana* was "essentially a more southern form than the preceding which it mostly replaces in the south and east of the state." To complete this account of the range of the two subspecies which we have, Krombein et al. give that of *C. plumipes plumipes* as the Carolinian zone from Massachusetts to Georgia, Kentucky and of *C. plumipes fossulana* as Austroriparian zone from Maryland to Florida, west to Texas.

Of the 24 specimens collected in the Preserve, 16 were *plumipes fossulana* (6 males and 10 females) and 8 were *plumipes plumipes* (3 males and 5 females). This greater number of females doesn't bear out our original conclusions as to their scarcity, and more study is needed. Both males and females occur frequently on flowers (*Clethra alnifolia* is a favorite), but the males are most commonly seen feeding in the fall when they are often to be found on a *Euonymus* sp.

I've been interested to find that mutillid wasps also use this same flight ground. Three or four may be found on it quite frequently, often flying with *Campsomeris plumipes*, and I've wondered why it should attract either species. The area is apparently barren except for the pine straw on the ground and a few pines overhead. And yet here such *Campsomeris* matings as we have seen have taken place, and it's here that we have twice seen *Campsomeris* females digging into the ground in search of beetle grubs; once in April '80 and again on March 30, '93. It's been stated that Scoliid wasps use the larvae of the Scarabaeidae for prey, but as far as I know the only record of a specific prey larva for *Campsomeris* is that provided by Frank E. Kurczewski (1966) for *C. p. confluenta* when he found this wasp using the larva of *Cotalpa lanigera* (Linnaeus). Our immediate question was do our wasps have a similar prey-host relationship? *Cotalpa lanigera* is found in North Carolina and might well be in our area, but has never been collected at the Preserve. The greatest number of scarab beetles occurring at Weymouth are species of *Phyllophaga*, and *Phyllophaga micans* (Knoch) has been observed mating in the leaf litter (pine straw and oak) where we first noted a big *Campsomeris* flight. Another similar mating of this species took place on the lawn close to the regular flight ground. Ross H. Arnett, Jr. (1985) states that the larvae of Scoliid wasps are parasitic on the white grub larvae of scarab beetles, especially the species of *Phyllophaga*. In view of the great number of *Campsomeris* wasps found in the Preserve, a large number of acceptable prey larva is also indicated, and *Phyllophaga* seems the most obvious answer. However, until an actual specimen can be collected, we can't say that any prey-host relationship has been established. Obviously there is much work to be done here in the future.

One last note. We have seen no circular or figure-8 course such as that described by Curtis P. Clausen (1940) for many of the Scoliidae. The general behavior of our wasps and their flight pattern of a "zigzag course" and a "vague monotonous flight" comes closer to the description provided by the Raus (1918) in their notes on *Scolia dubia* (Rohwer).

Literature cited

Arnett, Ross H. Jr. 1985. American Insects. Van Nostrand Reinhold Co.

Bradley, J. Chester. 1928. The Species of *Campsomeris* (Hymenoptera Scoliidae) of the *plumipes* group, inhabiting the United States, the Greater Antilles, and the Bahama Islands. Proc. Acad. of Nat. Sci. Phila.

Brimley, C.S. 1938. The Insects of North Carolina. N. Car. Dept. of Agri.

Clausen, Curtis P. 1940. Entomophagous Insects. Hafner Pub. Co.

Krombein, Karl V., Paul D. Hurd, Jr., David R. Smith and B.D. Burks, 1979. Catalog of Hymenoptera in America North of Mexico. Smithson. Instit. Press.

Kurczewski, F. E. 1967. *Campsomeris plumipes confluenta* (Scoliidae) preying on the Gold Beetle, *Cotalpa lanigera* (Scarabaeidae), in Kansas. Kans. Ent. Soc. Jour. 40:208-209.

Rau, Philip and Nellie. 1918. Wasp Studies Afield. Princeton Univ. Press.

Neotropical Social Wasp Folklore

by

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Over the course of my peregrinations through Central and South America I have come across a number of fascinating local names, beliefs, and stories about eusocial vespid wasps, as related by Latino and indigenous (Indian) rural people. The legends range from the fantastic to the well documented, if not well understood. A few of these beliefs raise interesting questions with definite potential for future scientific research. Here I outline some of my favorites; I would very much like to hear from anyone who can add to this collection.

Local Names of Wasps

Rural people in Latin America often give insightful, descriptive names to the animals and plants important or notable in the habitats around them. Eusocial wasps are not excepted, with their potent defensive capabilities and often striking nest architecture. Avispa is the Spanish word for wasp.

1. *Synoeca* spp. build beautiful corrugated nests on tree trunks and are legendary for painful stings, and are thus often distinguished from other wasps. They are called carachupa (= suck face, local name for the nine-banded armadillo) avispa in amazonian Peru because *Synoeca* nests resemble arboreal armadillos. These wasp colonies are referred to as guitarron (big guitar) in Costa Rica because of the rasping sounds they produce on their nest cartons when disturbed.

2. *Chartergus* spp. build large white nests high in trees and are referred to as campana (bell) avispa in amazonian Peru in reference to the nest shape. These nests are constructed of exceptionally durable carton, and local guides

assured me that they are continuously occupied for at least several years.

3. *Epipona* spp. are very aggressive and cling tightly to vertebrate objects of their wrath when stinging (don't they, Jim?); they are referred to as quita calzon (roughly, take off your underwear) in Costa Rica.

4. In many areas, certain wasps are observed to scavenge vertebrate flesh. These species are widely known as carnicera (lady butcher); in my experience, local people recognize both flying foragers and the nests of these wasps. Examples include *Agelaia multipicta* in the Venezuelan llanos, and both *A. hamiltoni* and *Angiopolybia pallens* in amazonian Peru.

5. *Polybia sericea* is common in the Venezuelan llanos, where I have found that it builds larger nests and achieves greater colony sizes than it does in the brazilian amazon near Santarem (R.L. Jeanne, pers. comm.). Its local name in the llanos is mata mono (monkey killer); one ranch owner related the tale of a *P. sericea* colony attacking and killing a young horse tied near the nest.

Social Wasp Folklore

Good luck charms: In Guanacaste Province, Costa Rica, the swarm-founding wasp, *Polybia occidentalis*, is often found nesting on the eaves of houses. Successful colony establishment on a house is taken as a sign of good fortune by local people (Guanacastecos).

Sweat calms the savage wasp: In Costa Rica and in northeastern Peru it is commonly held that swarm-founding wasps are calmed by the smell of human sweat, to the point that occupied nests can be crushed or collected without evoking stinging attacks. There is disagreement as to whether this is true for all humans, or whether only certain individuals can succeed as "wasp charmers". A friend from Guanacaste, Costa Rica assured me that her father was renowned around the town of Santa Cruz as a wasp nest removal specialist because he was immune from attack. An account of this phenomenon in northeastern Costa Rica was published by Young (1978). Peruvians in the vicinity of Iquitos carry this belief further, claiming that wasp nests can be collected safely by anyone who wraps them in a sweaty shirt. In this area, an important added precaution in calming the wasps is biting down on the tip of one's tongue while approaching the nest, shirt in hand.

Seasonal changes in nest sites: *Polybia ignobilis*, a large black wasp with a reputation in the Venezuelan llanos for a nasty temper, moves onto and into buildings (including houses) in the wet season and builds large nests. The arrival of *P. ignobilis* colonies is a despised wet season event. This wasp is rarely seen in the dry season, and apparently never on buildings. An especially observant llanero cowboy showed me two active late dry season colonies under scrap metal within 0.5 m of the ground; both were without brood and were only meekly defended.

Suffocating wasp: Several Costa Ricans told me that the sting of *Polistes carnifex*, an impressive bright yellow wasp in the *P. major* group, results in rapid cessation of the victim's breathing. The required remedy is to enter a stream or pond submerged up to the chin, which restores the breath, and remain there for several hours.

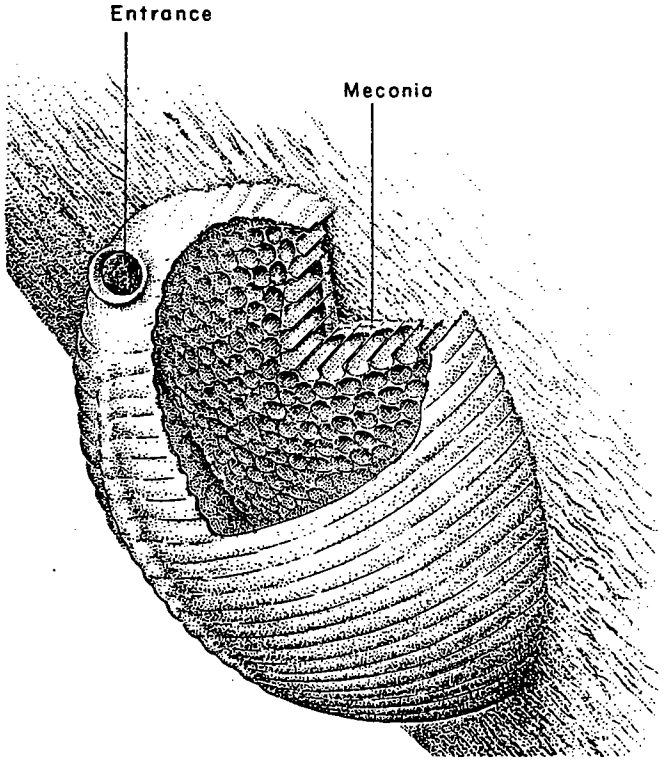
Avispa bufeo (Dolphin wasp): In Amazonian Peru, the wasps are apparently super-serious about stinging. One species reputedly follows people who molest its nests and jump into water to escape attack; the wasps are said to dive to a depth of 1 m to envenomate victims lulled into a false sense of aquatic security. I was unable to ascertain the wasp species, but it was said to nest under leaves.

Sting cure?: Many people have told me that relief of sting pain is obtained by crushing the offending wasp's body on the sting site. This is a commonly held belief in Costa Rica, Panama, and Peru. I have not been able to bring myself to try it, in part for fear of incurring more stings in the attempt.

The sting is, indeed, the thing: I have been told of an impressive amazonian Indian rite of passage into manhood. The initiates climb a platform to a large arboreal carton nest (possibly belonging to *Polybia lileacea*), and beat on the nest with sticks. This is continued until the boys fall unconscious from the stings received. Something to remember next time you're feeling tough because you work with vespid wasps....

Reference

Young, A.M. 1978. A human sweat-mediated defense against multiple attacks by the wasp *Polybia diguetana* in northeastern Costa Rica. Biotropica 10: 73-74.



Nest of *Synoeca surinama* on the underside of a large branch.

ICZN NEWS

Bulletin of Zoological Nomenclature 46 (3):209, September 1989:

OPINION 1559

***Ludita* Nagy, 1967 (Insecta, Hymenoptera): *Tiphia villosa* Fabricius, 1793 designated as the type species**

Ruling

(1) Under the plenary powers all previous designations of type species for the nominal genus *Ludita* Nagy, 1967 are hereby set aside and *Tiphia villosa* Fabricius, 1793 is designated as type species.

(2) The name *Ludita* Nagy, 1967 (gender: feminine), type species by designation under the plenary powers in (1) above, *Tiphia villosa* Fabricius, 1793, is hereby placed on the Official List of Generic Names in Zoology.

(3) The name *villosa* Fabricius, 1793 as published in the binomen *Tiphia villosa* (specific name of the type species of *Ludita* Nagy, 1967), is hereby placed on the Official List of Specific Names in Zoology.

Bulletin of Zoological Nomenclature 47 (1):73, March 1990:

OPINION 1578

***Vespa triangulum* Fabricius, 1775 (currently *Philanthus triangulum*; Insecta, Hymenoptera): specific name conserved**

Ruling

(1) Under the plenary powers the specific name *ruspatrix* Linnaeus, 1767, as published in the binomen *Vespa ruspatrix*, is hereby suppressed for the purposes of the Principle of Priority but not for those of the Principle of Homonymy.

(2) The name *triangulum* Fabricius, 1775, as published in the binomen *Vespa triangulum*, is hereby placed on the Official List of Specific Names in Zoology.

(3) The name *ruspatrix* Linnaeus, 1767, as published in the binomen *Vespa ruspatrix* and as suppressed in (1) above, is hereby placed on the Official Index of Rejected and Invalid Specific Names in Zoology.

COLLECTING REPORTS

Misiones Province, Argentina

by

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This past September John Wenzel and I went to Misiones Province in Argentina, hunting social wasps. The province is famous as the site of Iguazu Falls, recently seen as the spectacular scenery in the film "The Mission". The forest certainly appears lush in that film, and 36 species of Polistinae are recorded from the province, including the monotypic genus *Protonectarina.* This genus was one of only four for which we had no ethanol-preserved specimens for the molecular analysis now being undertaken by Wenzel as an American Museum postdoc. The Entomology Department of the AMNH has an NSF faunal surveys grant specifically for collecting in Argentina and Chile, and funding was thus not a problem. So we anticipated good collecting, even though we came towards the end of the dry season (roads being a problem in the wet season, as we learned to our regret in Bolivia the previous year). But the trip was saddening; most of the forest in Misiones is gone, replaced by pine and eucalyptus plantations! Even the national park around the falls was logged, selectively but heavily, 70 years ago. The lush understory is mostly cane, close to impenetrable and sterile if you can penetrate it. We did find better, intact forest in the provincial park Urugua-I (south of Puerto Iguazu) and in the sierra running down the spine of the province. But even in the mountains the timber trails were visible where the big trees had already been dragged out on chains, and Paraguayan squatters were everywhere. The economics of the situation are pretty compelling: the pine is at marketable height in about ten years; by 13 the stands are halved, and all of the stand is cut by 15 years. We still collected nine genera of polistines (23 species), but few nests (the only epiponines were *Agelaia multipicta*, *Apoica pallens*, *Polybia paulista* and *Synoeca cyanea*). We did find *Protonectarina sylveirae* – foraging at timber spoil! Workers were coming to old campfire ash, licking up salt or something (a behavior we'd never observed in polistines). No nests, but in the meantime we now have specimens preserved in ethanol. Usually success spurs one's collecting effort, but we just ended up changing our flights and coming back early after we got the target taxon. Driving thousands of kilometers looking for potential sites is not my idea of fun, and scoring in timber spoil is a little too ironic. The wave of the future as far as tropical collecting goes, I fear.

Oh yeah, we learned a couple of Guarani names for wasps, which showed that the aborigines could distinguish between the nests of *Polybia scutellaris* ("cabichui", a. k. a. "caraboza" in Brazil) and *paulista* ("carnoati"). And we bought a couple of sets of boleadores as tourist trophies and upped our serum cholesterol level on the incomparable Argentine beef. And the Falls really are worth seeing. So we really can't be too negative.

The Search for Aquatic Mutillids

by

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Although my title is somewhat tongue-in-cheek, it pretty accurately describes my research excursion of 1992. I was on sabbatical leave from Clemson University from April through September in order to study velvet ants, especially those belonging to the genus *Dasymutilla.* The first month was spent traveling to various museums in order to examine type specimens. I visited the Philadelphia Academy of Science, the American Museum of Natural History, Cornell University, the Canadian National Collection, the University of Laval (Quebec), and the University of Minnesota. Many thanks to all of you who assisted me. It was during this month that I was most worried about the weather. However, the weather during this northern excursion was most cooperative.

I then set out for five months of collecting and field study. Although my travels were widespread, most of that time was spent in the Southwest (Texas to California), a hotbed of mutillid diversity. During that five months, I doubt that there were five days in which I did not encounter at least some rain. There were often periods of 1-2 weeks at a time when it did not stop raining (hence my title). I brought rain to some desert lo-

cations that I don't believe had seen rain in decades. It started raining in California about the time of my first visit, and I don't believe that it has stopped yet. (I should have hired out my services as a rainmaker.)

One of the major goals of my fieldwork was to be able to make proper sex associations within the group. Of approximately 150 described species of *Dasymutilla* (North of Mexico), about a third are known from females only, and about a third from males only. The wet weather seriously hampered this effort, as there were many times when males were scarce or non-existent. The females seemed to weather the storms surprisingly well. Freshly emerged females were often thickly covered with mud.

Had it been just a collecting trip, it would have been very successful. I collected nearly 2500 mutillid specimens, and could have picked up many more (once I got a good series, I did not continue to pick up the same species). Of these, about 1750 were *Dasymutilla*. This number included 86 species (or subspecies) of *Dasymutilla*, plus a few undescribed species. I was not able to make as many sex associations as I had hoped, but was still able to make a few. I was also able to collect evidence for synonymizing certain species.

During the western trek, I stopped to examine type specimens at Kansas State University, Washington State University, and the California Academy of Science. I also made stops at UC Davis, New Mexico State, the University of Texas, Texas A & I, and Montana State. Highlighted collecting stops were at the Southwestern Research Station (Portal, Arizona), the Chaparral Wildlife Management Area (Texas), Lake Texoma Biological Station (Oklahoma), Big Bend National Park, and several locations around Austin, Texas. In all, I traveled 37,000 miles, visited 37 states and 3 Canadian provinces, and collected an average of about 15 velvet ants per day. All of this in spite of extremely wet, unseasonably cold, weather. Again, thanks to all of you who helped me during the course of this trip.

Collecting in Northeastern Brasil

by

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The Hymenoptera fauna of Northeastern Brasil is one of the most poorly known and collected in South America. This region has not received the attention that collectors have given to the Amazon forest which, because of its lushness, has attracted many explorers. The collection of the Museu de Zoologia da Universidade de São Paulo has little material from this region. Also in many studies on the South American Hymenoptera fauna one can see a gap in the distribution of taxa, represented by an empty band that runs from Central Brasil to the northeastern Brasilian coast.

The collection trips in which I participated were part of a project designed to study the behavioral ecology and the ecological and geographical distribution of social Hymenoptera and Isoptera in the main vegetation zones of Northeastern Brasil. We selected the localities to be visited as samples of different kinds of vegetation zones that cover the region. The project was coordinated by Dr. Carlos Roberto F. Brandão (ants) in association with Dr. Eliana Marques Cancello (termites) and Dr. Paulo Oliveira (ants). Also participating in this project was Prof. Jorge M. Diniz (ants), Marcelo T. Pontes (termites), Prof. Paulo Moutinho (ants), Dr. Celso Martins (bees), Marcia Françoso (ants) and Adriana Reis-Menezes (ants). My role in this project was to collect flying Aculeata. We made three trips in 1990 and 1991, each lasting 30-35 days in the field, traveling at least 18,000 km in a van, always starting from São Paulo.

On the first trip we collected in the central and south central regions of the State of Bahia during the month of November, 1990. The team on this trip was composed of Brandão, Cancello, Oliveira, Pontes, Diniz and me. After three brief stops at Pedra Azul (State of Minas Gerais), Anajé and Vitória da Conquista (State of Bahia), we reached our first collection station, Maracás. This little village was named after the Indians that inhabited the region in the 17th century. They were very fierce, their favorite weapons being hollow clubs made of hard wood filled with pebbles. When attacking their enemies, the Indians used to shake the clubs, which due the pebbles, produced a frightening maraca sound.

The region of Maracás is covered mainly by a kind of arboreal "caatinga", called by their habitants "mata de cipó". Caatinga is the predominant vegetation zone of northeastern Brasil, characterized by a xerophytic, semideciduous vegetation, with many kinds of cacti and other plants adapted to dry climates. The climate is semi-arid, with a dry season lasting at least six months, and a rainy season that can be very short or even wanting. The so called "mata de cipó" (that literally means vine forest) is composed of trees up to 10 m high and trunks no more than 30 cm in diameter. The forest is somewhat dense, with a great number of vines that give a false appearance of a very intricate forest. In reality it was relatively easy to walk inside the woods, provided one pulls the vines away from the trails.

When we arrived at Maracás the rainy season was just beginning, and the wasps and bees had recently begun to reappear in the field. We chose to work at a cattle farm, named Maria Inácia Farm, 4 km E of the village. There we found a good reserve of native forest, with convenient tracks also used as flight paths by large specimens of *Xylocopa, Pepsis, Bombus* and other flying creatures. There were always flying insects over the trail; flying, of course, invariably too high to be captured with my net. However, at this locality I collected some very interesting sphecids. Among the trophies were two *Paradolichurus* (*maranhensis* ?), collected over fallen leaves that covered the soil. These little wasps were very active, running and taking short flights, creeping among the leaves, probably looking for roaches.

The most peculiar neighbor during our stay at Maria Inácia Farm was a *Bothrops* sp. snake, popularly known as the "jararacan", and very well known to our inlanders, having a terrible and deserved reputation as one of the most dangerous and poisonous creatures in the backwoods. Our neighbor was a very methodical animal. Eliana Cancello was the first of us to meet her. Eliana used to demarcate 10 m^2 quadrants with string, for quantitative samplings of termites. With all the woodland available for quadrants, she managed to include the jararaca's territory in her first quadrant. Obviously, Eliana had not intended to work with a dangerous snake as

a partner. When she first delimited her quadrant, our jararaca friend was sleeping under a fallen trunk. The next morning, when we really began to collect in this locality, Eliana discovered the jararaca taking a sun-bath on a fallen trunk just beside her collecting tools. From among her many options, Eliana chose to move to a new area, leaving the old one for the jararaca. Later we discovered that the fallen trunk was the jararaca's penthouse. She used to take her sun-baths everyday on the same trunk, leaving it punctually at 10:00 a.m. to return to her hiding place. I confirmed this routine during the 5 days that we spent in Maracás, and even took some photographs of her under the sun.

Upon finishing our work in Maracás, we went to our next stop: Itaberaba. We chose to go there on a cart-road that gave us a lot of shaking, but also splendid scenery. Departing from Maracás we passed through Planaltino (from where one can see a magnificent vista of the valley of the Paraguassú River), Marcionílio Souza, João Amaro, Iaçu, and finally reached Itaberaba. In Itaberaba we stayed in a peculiar hotel. Air conditioned rooms were available, but without windows. They looked like chambers in a cold storage plant, and had a strong mold smell. Fortunately, there were rooms with windows equipped with fans, which, obviously, was our choice.

At Itaberaba we established our collecting base at another farm, Riacho do Urussú, some 30 minutes from the town. This locality was covered by another type of caatinga, called "caatinga de lajedo", characterized by the presence of many cacti, some Bromeliaceae and many spiny brushes. The so-called lajedo are bare areas were the soil is composed only of huge nude sedimentary rocks with some vegetation growing in the crevices, mainly cacti and Bromeliaceae.

It was very hard to work in this place. When we arrived there, the rainy season had not yet begun. The heat was unendurable, reaching 40°C in the shade. It was also very dry and there was almost no wind. However the wasps appeared to enjoy it, having their activity peak at noon. It was true that there were few creatures flying in this place, but the flying ones seem to prefer the hottest hours of the day. I think that they did it only to annoy me. However, I had the opportunity of collecting some males of *Trypoxylon lenkoi* Amarante, and observed their interesting behavior. They were engaged in a kind of dispute for a perch at the tip of a dried twig at one tree. The owner of the position remained perched at the tip of the twig, facing toward its extremity. Occasionally another male arose and launched himself over the perched male. The perched male, abandoning his perch, chased the intruder, returning to his initial position. After I had observed this behavior for some minutes, I decided to collect the wasps. With my net, I collected one perching male, who was promptly replaced by a new one. Until I broke the twig with the impact of my net, I repeated this collecting routine 4 more times, at the end of which I had 5 wasps inside my killing bottle. I have examined the broken twig, but did not find any vestige of a nest that might have been the reason for this territorial behavior.

Leaving Itaberaba we went to Mucugê, our next stop. Mucugê is located in the heart of the Chapada Diamantina, a plateau situated in the geographical center of the State of Bahia. The view from the road with the Chapada Diamantina in front of us was impressive. At the base of the plateau we passed by Andaraí and began to ascend into the mountains. This was like travelling on another planet. The scenery was very strange, due the peculiar vegetation and rock formations. Our arrival at Mucugê provided us with another beautiful picture. The little town is nestled in a valley, surrounded by steep rocky hillsides. The city was established about 1840, when a muleteer found diamonds in the gravel of the Combuca River. With diamond prospecting, the city grew and prospered, reaching more than 100,000 inhabitants. Today the population is no more than 5,600, and surrounding the town one can see the remains of walls of old houses. Those days of prosperity provided some interesting stories and tales, as, for example, the miners that used to bathe their horses with French Champaign to celebrate the discovery of a great diamond.

At Mucugê, we worked beside the Andaraí-Mucugê road, near the bank of the Combuca River. The predominant vegetation in the region is composed of "campos ruprestes", a typical grassland that occurs from an altitude of 900 m mainly in the Espinhaço Range in the states of Bahia and Minas Gerais. The climate is characterized by a dry period of 3-4 months and a wet period of 7-8 months, with an average temperature between 17° and 20° C. Its sandy soil is very poor, with many rocks. The vegetation has a number of endemic species, strongly adapted to the poor soil conditions. It was a nice place to work: mild temperatures, pretty landscape and an open field that allow me to use the net without tangling it in the vegetation. There I found a number of nests of *Trypoxylon albitarse* F., constructed inside the numerous cavities and crevices in the rocks.

Our next and last stop on the first trip was Andaraí, a small town that was also founded because of diamond prospecting. The decadence of Andaraí was not as conspicuous as that of Mucugê, and the city still has many of its old houses. Here we collected in a wooded area by the road, circa 10 km E of the city. The woods are a remnant of an enclave of the Atlantic Rain Forest inside the Caatinga domain. In the two days that we worked here, I collected one more specimen of *Paradolichurus*, a different species from the one collected in Maracás, but exhibiting the same behavior. However, the most impressive event in the woods was a raid of *Eciton* ants that were in the statary phase during our stay there. Some columns of these army ants had a width of at least 1.5 m, with a huge number of individuals. To explore and collect in these woods, my first reaction was: first locate the raid and then go in the opposite direction, as the ants looked too hungry for my taste.

Seven months later, at the end of June of 1991, we took to the road again. This time the group was initially composed of Brandão, Françoso, Reis-Menezes and me. Our purpose was to collect at three localities with cerrado vegetation in the State of Goiás and somewhere in the northwest of Bahia or in the south of Piaui.

We began to collect at the Reserva Biológica de Águas Emendadas, located 25km northeast of Brasilia. This reserve incorporates an area of typical cerrado, the predominant vegetation zone in central Brazil. It is called Águas Emendadas (joining waters) because from the same spring inside the reserve, two creeks depart in opposite directions. The southern one flows into the Paraná basin, reaching Buenos Aires some 4000 km to the south, while the northern one joins the Amazon drainage basin. This was a good place to work, with some facilities as well as trails and accommo-

dations. The trails are also convenient for digging wasps and bees as it has many suitable places to nest. Taking advantage of this local feature, I collected some very interesting sphecids such as *Stangeella cyaniventris* (Guérin-Méneville) and *Antomartinezius* sp. These genera have never been recorded this far north. Both have been considered as restricted to southern South America.

Departing from Aguas Emendadas, we went to Alto Paraíso de Goiás, another small town, but located in one of the most beautiful places that we saw during our trips. Here we again collected in campo rupreste vegetation, but now within the cerrado domain. We worked outside the borders of the Parque Nacional da Chapada dos Veadeiros, which like all national parks in Brasil, has rigid regulations for collecting, even for small invertebrates. One of the interesting peculiarities of this locality is its reputation, among "new age" people, of being one of the preferred visiting sites of E.Ts. (extra-terrestrials) in South America, perhaps due to its healthy climate and amusing wild trick walks. However, the only green skinned things we found were bugs.

Going to our next stop, Alvorada do Norte, we travelled across the Paranã River valley, a very deserted region. The cart-road was very uneven, and we had to cross at least two creeks without bridges and the Paranã River on a thing that resembled a ferryboat, which we had to move by pulling a rope. We arrived at Alvorada do Norte entirely covered by a fine dust, which today still permeates our van. There we watched an entertaining rodeo and the following morning began our work. We chose to work on a cattle farm on top of the Serra Geral de Goiás, just above the city. The locality was covered by a kind of cerrado, called "campo sujo", which is characterized by trees spaced over a grassland. Soon I discovered the best place to catch wasps, a small mud pool. As we were at the beginning of the dry season, the creatures from the vicinity converged on this pool; all I had to do was to sit around and wait them. In the five days that we stayed there, I got 9 specimens of *Podium rufipes* F. with my net. This was a great feat, as the wasps are very fast, flying no more than 10 cm above the soil and resting near the pool for less than 5 seconds at a time, causing me to catch a lot of pebbles and mud instead wasps. Another example of how flying creatures defend themselves from entomologists was an episode occurring between Celso Martins and a *Centris* male. Celso, who had joined us few days before, was catching bees at the flowers of a tree when he noted a "fat" bee flying in a constant figure-eight pattern just above the tree. When Celso tried to get him, the male *Centris* merely adjusted his path, taking care to fly a little higher when he passed over Celso. After many unsuccessful attempts, Celso left the bee to fly freely, but promised to return with a larger net.

Leaving Alvorada do Norte we went to Santa Rita de Cássia, in northwestern Bahia. This city is situated about 30 km from the border of the State of Piaui, on the left bank of the Rio Preto River. It is a very isolated place, the nearest city being 100 km away. The region is covered by an arboreal caatinga, somewhat similar to the Maracás' mata-de-cipó. Here we collected at a rural district, named Riacho do Veredão, about 20 km from the town. There had been no rain for at least one month when we arrived, and the vegetation had lost all of its leaves. There were few flying creatures in the woods, but fortunately I found a cattle well, with muddy water and an impressive number of Aculeata. Here I caught a number of *Trypoxylon* spp., one *Pison aureofaciale* Strand and one *Aulacophilus eumenoides* Ducke. One afternoon, Celso and I went looking for a better place to collect. We found it by following the bank of the Rio Preto River, going east. Among the good specimens that I took here were some *Antomartinezius*, very far from its known geographical distribution in Argentina. Santa Rita was our last stop on this trip.

Four months later we were on the road again, this time going to the State of Piaui. This was the last and longest trip. We traveled about 6,000 km, spending 35 five days in the field. The team this time was: Brandão, Cancello, Pontes, Moutinho, Martins and me. We started collecting at Floriano, a city located on the south bank of the Parnaíba River. Here we stayed for the first time at a good hotel, with a pool and air conditioned rooms (with windows!). The hotel's pool was also a convenient insect trap, acting like a huge blue pan. At the end of the day, after 10 hours of work under a hot sun, we would swim and collect the nonswimming bugs; one of the most pleasant collecting methods I ever tried. Our collecting field was a place called Buriti Sol, 20 km south of Floriano. The vegetation was very peculiar, composed of a mixture of caatinga and cerrado. The cerrado plant species were represented by higher trees and the caatinga species by bushes and cacti. After many experiments on the other trips, I had fixed up my homemade Malaise traps and improved the design of my yellow pans. The two Malaises, one Townes model and one suspended, and the yellow pans worked fine, catching some *Trypoxylon* species and one example of *Pison plaumanni* Menke, among others aculeates.

Our next collecting station was Oeiras, an old town that had been the former capital of the State of Piaui. It is a beautiful city, founded in the middle of the 18th century, and having some beautiful old churches and houses of historic interest. We worked not too far from the city, at a cattle farm, Fazenda Talhada, 5 km E of the town. Here we found a typical caatinga that was beginning to flourish due to the start of the rainy season. The most unexpected creature that I got here was a female of *Tiguipa* sp., collected beneath a bush at the border of the Canindé River. This sphecid genus was previously known only from Argentina and Paraguay. I also found a huge aggregation of *Bembecinus quinquespinosus* (Say) on the sandy road just in front of our collection site. The nests of these wasps occupied a stretch of road at least 50 m long. In one day I got about 90 specimens of these wasps merely by walking along the road while sweeping my net a few centimeters above the soil.

From Oeiras we went to Canto do Buriti were we worked in a caatinga de lajedo. There we found a very convenient site to work: just behind our hotel. However, it was near the hotel pool where I got the best material for this locality. The pool was out of order and its water looked like pea soup: green and dense. Around the pool there were two rustic-styled dressing rooms, with a straw roof where many individuals of *Aulacophilus eumenoides* Ducke, *Trypoxylon aurifrons* Shuckard, *Sceliphron asiaticum* (L.) and *Zeta* sp. were nesting. The *A. eumenoides* nested in the straw roof, but unfortunately, I could not get any nests, since to do so would require me to destroy the roof (which I believe would not please the hotel's manager very much).

Our next stop was at Corrente, were we worked at a cerrado locality 10 km north of the city. This region is located on the border of the cerrado zone, and there this kind of vegetation is restricted to the top of the chapadas (mesas), while in the plains you can see the caatinga. It is a very beautiful region, with many untouched places. However, it is too far from home, and we were becoming homesick and tired; so, after working there for 5 days, we started back home. After driving 1,906 km for 4 days we were back at sweet São Paulo, with a lot of bugs to identify and many stories to tell.

The Sphecidae collected on these trips are listed below. I indicate the localities where the species was collected by the following abbreviations: AE (Águas Emendadas, DF), AP (Alto Paraíso de Goiás, GO), AN (Alvorada do Norte, GO), Aj (Anajé, BA), Ad (Andaraí, BA), Co (Corrente, PI), CB (Canto do Buriti, PI), Fl (Floriano, PI), It (Itaberaba, BA), Ma (Maracás, BA), Mu (Mucugê, BA), Oe (Oeiras, PI), SR (Santa Rita de Cássia, BA) and VC (Vitória da Conquista, BA). Significant range extensions are indicated by an asterisk.

AMPULICINAE

Paradolichurus sp 1 (Ma)
Paradolichurus sp 2 (Ad)

SPHECINAE

Sceliphrini
* *Stangeella cyaniventris* (Guérin-Méneville) (AE)
Podium rufipes Fabr. (AN, AE)
Sceliphron asiaticum (L.) (CB, Oe, Aj)
Sphecini
Isodontia sp. 1 (It, Mu)
Isodontia sp. 2 (AN)
* *Prionyx spinolae* (Smith) (AN, Fl)
Prionyx thomae (Fabr.) (It)
Sphex latro Erichson (AP, AN)
Sphex opacus Dahlbom (Ma)
Ammophilini
Ammophila sp. (Ma)

PEMPHREDONINAE

Psenini
Pseneo etiasi van Lith (AN)
Pluto smithii (Fox) (Ad)
Pemphredonini
Spilomena sp. (AE)
Stigmus sp. 1 (Ma)
Stigmus sp. 2 (AN)
Stigmus sp. 3 (Oe)
Stigmus sp. 4 (AN)

ASTATINAE

Astata sp. (SR)

LARRINAE

Larrini
Larra sp. (Co, Oe)
Liris spp. (It, SR, Ma, Mu, AE, VC, Ad, AP, Oe, Co)
Tachysphex acutemarginatus Strand (SR, Oe)
Tachysphex advenus Pulawski (AE, AP)
Tachysphex sp. cf. *apoctenus* Pulawski (Oe)
Tachysphex inconspicuus (Kirby) (Mu, SR, It, Ad)
Tachysphex iridipennis (Smith) (Co)
Tachysphex ruficaudis (Spinola)(Aj)
Tachysphex subandinus Pulawski (Mu)
Tachysphex sp. 1 (Mu, Ma, AN)
Tachysphex sp. 2 (AN)
Tachytes amazonus Smith (Ad)
Tachytes pretiosus Cameron (Ma)
Tachytes setosus Taschenberg (AE)
Tachytes cf. *pubescens* Bohart (Ad)
Tachytes zuliae Bohart (Ma)
Tachytes sp. (Co)
Miscophini
Lyroda sp. (Co)
Nitela sp. (Ma)
Solierella sp. 1 (Co, CB)
Solierella sp. 2 (AP)
Solierella sp. 3 (SR)
Bothynosthetini
Bothynostethus sp. (Oe)
Trypoxylini
Aulacophilus eumenoides Ducke (CB, SR)
Pison aureofaciale Strand (Co, SR, AN)
Pison brasilium Menke (AP)
Pison delicatum Menke (AE)
Pison euryops Menke (AP)
Pison pilosum Smith or *vincenti* Menke (AN)
Pison plaumanni Menke (Co, Fl)
Trypoxylon (Trypoxylon) sp. 1 aff. *nitidissimum* Richards (CB)
Trypoxylon (Trypoxylon) sp. 2 aff. *nitidissimum* Richards (Co)
Trypoxylon (Trypoxylon) sp. 3 aff. *nitidissimum* Richards (Ma)
Trypoxylon (Trypoxylon) cornigerum Richards (Oe, Fl, CB)
Trypoxylon (Trypoxylon) asuncicola Strand (Co, AE)
Trypoxylon (Trypoxylon) sp. aff. *fitzgeraldi* Richards (Co, Fl)
Trypoxylon (Trypoxylon) sp. cf. *florare* Richards (SR)
Trypoxylon (Trypoxylon) sp. aff. *xenophon* Richards (Ad)
Trypoxylon (Trypoxylon) scutiferum Taschenberg (Ma)
Trypoxylon (Trypoxylon) sp. aff. *segregatum* Richards (Ma, AN)
Trypoxylon (Trypoxylon) sp. 1 aff. *pentheri* Richards (Co, FL Oe, Ma)
Trypoxylon (Trypoxylon) sp. 2 aff. *pentheri* Richards (Mu)
Trypoxylon (Trypoxylon) sp. cf. *excellens* Strand (Co)
Trypoxylon (Trypoxylon) sp. aff. *caldesianum* Richards (Co)
Trypoxylon (Trypoxylon) sp. aff. *belardi* Richards (SR)
Trypoxylon (Trypoxylon) sp. cf. *capitale* Richards (Fl)
Trypoxylon (Trypoxylon) sp. cf. *duckei* Richards (Co, Fl, Ma, AN)
Trypoxylon (Trypoxylon) fiebrigi Richards (AN, Ma)
Trypoxylon (Trypoxylon) sp. aff. *punctivertex* Richards (Ma)
Trypoxylon (Trypoxylon) sp. aff. *figulus* (L.) (SR, AP, CB)
Trypoxylon (Trypoxylon) sp. incertis sedis (Ma, Mu)
Trypoxylon (Trypargilum) albitarse Fabricius (Mu, Co)
Trypoxylon (Trypargilum) mutatum Kohl (Fl, Co, SR, CB, Oe)
Trypoxylon (Trypargilum) sp. aff. *mutatum* Kohl (AN)
Trypoxylon (Trypargilum) sp. aff. *optimum* Richards (SR)
Trypoxylon (Trypargilum) sp. 1 aff. *triodon* Richards (AN)
Trypoxylon (Trypargilum) sp. 2 aff. *triodon* Richards (AN)
Trypoxylon (Trypargilum) sp. 3 aff. *triodon* Richards (SR)
Trypoxylon (Trypargilum) sp. 4 aff. *triodon* Richards (Ma)
Trypoxylon (Trypargilum) sp. 5 aff. *triodon* Richards (Co, Fl)
Trypoxylon (Trypargilum) nitidum Smith (Co, Fl, Ma, SR, Oe, VC, AP)
Trypoxylon (Trypargilum) aurifrons Shuckard (Co, CB, Ma)
Trypoxylon (Trypargilum) sp. aff. *nitidum* Smith (Ma)
Trypoxylon (Trypargilum) sp. cf. *obidense* Richards (Oe, SR, Fl, AN)
Trypoxylon (Trypargilum) lenkoi Amarante (It, Aj, *Mu)*
Trypoxylon (Trypargilum) sp. 1 aff. *punctulatum* Taschenberg (AN)
Trypoxylon (Trypargilum) sp. 2 aff. *punctulatum* Taschenberg (Fl)
Trypoxylon (Trypargilum) lactitarse Saussure (Ad)

Trypoxylon (Trypargilum) vagulum Richards (SR)

CRABRONINAE

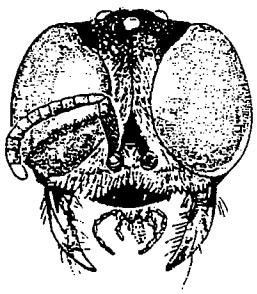
Anacrabro sp. (Co)
Ectemnius carinatus (Smith) (Ma)
Enoplolindenius sp. 1 (CB)
Enoplolindenius sp. 2 (AE)
Oxybelus genisei Bohart (Mu)
Oxybelus marginatus (Smith) (Ad)
Oxybelus sp. (AN, Co)

NYSSONINAE

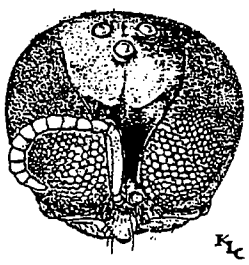
Nyssonini
* *Antomartinezius* sp. (SR, AE)
Epinysson sp. (Co)
Metanysson sp. (Co)
Heliocausini
* *Tiguipa* sp.
Gorytini
Hoplisoides sp. (Ad)
Ochleroptera sp. (Co)
Stizini
Bembecinus quinquespinosus (Say) (Oe, Mu, AN, Co)
Bembecinus sp. (Co)
Bembicini
Bicyrtes angulata (Smith) (SR)
Bicyrtes discisa (Taschenberg) (Mu)
Bicyrtes variegata (Olivier) (Ad)
Microbembex difformis (Handlirsch) (CB)
Rubrica nasuta (Christ)

PHILANTHINAE

Trachypus elongatus (Fabr.) (Mu)
Trachypus patagonensis (Saussure) (AE)
Trachypus sp. 1 (AP, Ma)
Trachypus sp. 2 (Co)
Trachypus sp. 3 (AP)
Cerceris sp. 1 (Ad)
Cerceris sp. 2 (Ad)
Cerceris sp. 3 (SR, AP)
Cerceris sp. 4 (Ma)
Cerceris sp. 5 (AE)
Cerceris sp. 6 (SR)
Cerceris sp. 7 (Ma)
Cerceris sp. 8 (Ma)



Anacrabro boerhaviae



Piyumoides

Facial portraits of females of the tribe Crabronini

MUSEUM/COLLECTION NEWS

Manfredo Fritz Collection to American Museum of Natural History

by

James M. Carpenter
Dept. of Entomology, American Museum of Natural History, Central Park West at 79th Street, N.Y., N.Y. 10024

The American Museum of Natural History has negotiated the purchase of Manfredo Fritz's personal collection. This consists of about 30,000 specimens of Aculeata (bees and wasps), including about 1,200 paratypes, primarily collected by Manfredo himself in Argentina, Chile, Bolivia and Paraguay. Manfredo's indefatigible collecting is well known to anyone who's been in the field with him, and his collection is thus one of the best in existence for the areas covered. Along with the fruits of Jerry Rozen's innumerable trips to Chile and Argentina, and the material now accumulating under the auspices of the NSF faunal surveys grant to the AMNH Entomology Department, we now have an extraordinarily complete aculeate collection for southern South America. So far the Mutillidae and Polistinae have arrived in New York, with the remaining taxa to be shipped in lots over the coming year.

Types of Philippine Sphecidae and Mutillidae to Smithsonian

Prof. K. Tsuneki has been publishing papers on Philippine aculeates in recent issues of the *Special Publications of the Japan Hymenopterists Association*. He has generously donated the holotypes of the new taxa to the National Museum of Natural History, Washington, D.C. These represent species described in issues 39, 40 and 41 of the *SPJHA*.

A.S. Menke

A NOVEL TREATMENT FOR SNAKEBITE AND STINGS

C.D. Eardly (Biosystematics Div., Plant Protection Res. Inst., Private Bag X134, Pretoria 0001, South Africa), in response to Chris Starr's note on wasp stings (**Sphecos** 24:3), sends the following letter from the PPRI newsletter *INFO*, which originally appeared in *Getaway* of Aug 1992:

"I refer to your articles on snakes by Mr. Austin J. Stevens in the May and June issues of *Getaway*. I was slightly surprised that Mr. Stevens made no mention in his otherwise excellent article of the newly discovered electric-shock treatment for snakebites. Here in Kenya we also get most of the more dangerous snakes, as you do in South Africa.

"It has recently been proved that a most effective treatment for snakebite is to give the victim electric shocks of high voltage but low amperage, such as you get from a cattle prod or from the ignition system of a vehicle, outboard motor or motorcycle.

"One of these can usually be obtained even in the bush. Treatment consists of giving several shocks, both in the immediate vicinity of the bite and between the bite and the heart. This treatment is so effective that the Amref Flying Doctor Service in Kenya now carries a cattle prod on board its aircraft in case of just such an emergency.

"An advantage of this treatment, apart from its simplicity, is that there is very little, if any, necrosis of the tissue surrounding the bite.

"I can cite two cases in which this treatment almost certainly saved a life: one of a young man bitten by a cobra at Island Camp on Lake Baringo, and another of a girl bitten by a carpet viper at Koobi Fora, on the shores of Lake Turkana. Both were miles from any hospital, and both survived with virtually no ill effects.

"Our neighbour's dog was bitten on the eye by a spitting cobra, and was close to death when we administered the shocks from a cattle prod. Within one and a half hours the dog was on its feet, eating its dinner, and showed no signs of its ordeal.

"Interestingly, we have found this treatment also works for bee, scorpion and poisonous fish stings, and we have treated a number of cases of people stung

by stonefish in shallow water (we live by the sea). In two cases the victims had been stung hours before and were in severe pain, with the whole leg swollen right up to the groin. They had come long distances by canoe to reach us and were almost in a state of collapse.

"The electric shocks provided almost instant relief, and the swelling went down almost as we watched. Within half an hour the pain had eased and after an hour the victims could walk away unaided.

"My own granddaughter, aged five at the time, was stung by a scorpion hidden in her shoe. We used the spark plug lead of a vehicle in her case, and the pain eased at once.

"I have discussed this with several doctors, and none of them can say how it works, but they all know about it and in fact it was written up in the *Lancet* some time ago. It is perhaps enough that it does work, and most dramatically at that."

P.D. Hemphill
Sea Adventures
Shimoni, Kenya.

TRIVIA

Let's collect here:

"Tetaumatawhakatangihangakoauauotamateaturipukakapikimaungahoronukupokaiwhenuakitanatahu, location with a Maori place-name in Hawke's Bay, North Island, New Zealand; it translates as 'the hill on which Tamatea, man with the hot knees, who climbed mountains and slid down the other sides and thus travelled the land, played a flute to his loved one'; said to be the longest place-name in the world."

Cambridge World Gazetteer
ed. by David Munro.
Cambridge Univ. Press,
Cambridge, U.K., 1988,
733 p. + 112 p. world atlas.

Food for Thought

If an antennomere is three times longer than wide and it is 1 mm wide, how long is it? I have asked this question or others like it of a variety of people and only one person, my 93-year old father-in-law, has come up with the correct answer. It is 4 mm long. Disagree? Then try using percentages. If it were 50% longer than wide, it would be 1.5 mm long; 100%, 2.0 mm; 200%, 3.0 mm; 300%, 4.0 mm. What is the difference between 300% (= 300 per 100) longer and three times longer? No difference.

Our mass media use times longer than, shorter than, etc. loosely. But we are trying to communicate with each other, not make or stretch a point. If readers interpret "3 times longer than" in different ways, the only way to avoid ambiguity is to avoid using the phrase. It's better to use "three times as long as," or "L/W = 3."

F. Werner, 1992
from: The Coleopterists
Bulletin 46(2):141.

BIG BLUE BOOK ERRATA Part 20

Woj Pulawski again gets credit for finding most of the following.

p. 78, LC, L 22: Kenya is correct.
p. 78, LC, L 7 from bottom: 1899 is correct, not 1898.
p. 90, LC, L 20 from bottom: *levilabre* is correct.
p. 115, LC, L 13: *gratiosus* belongs in *Chlorion* according to Vardy (in litt.), who examined the type. Transfer to p. 89, RC.
p. 133, LC, L 4 & 7: 1908 is correct, not 1909.
p. 144, LC, L 21: 1908 is correct, not 1910.
p. 151, LC, L 11-12 from bottom: 1908 is correct, not 1910.
p. 151, RC, last two L: 1908 is correct, not 1910.
p. 172, RC, L 3: 1908 (*Psen*); Kenya, is correct.
p. 172, RC, L 11: 1908; Kenya is correct, not 1910; Nigeria, Zaire.
p. 184, LC, L 31: *angustus* is not in alphabetical order. It belongs before *annulatus*.
p. 211, LC, L 21 from bottom: 1899 is correct, not 1898.
p. 251, RC, last L: 1899 is correct, not 1898.
p. 291, LC, L 16 & 18 from bottom: 1899 is correct, not 1898.
p. 335, RC, L 7 from bottom: 1859 is correct, not 1858.
p. 336, LC, L 24 from bottom: 1908 is correct, not 1910.
p. 336, LC, L 20 from bottom: 1859 is correct, not 1858.
p. 336, RC, L 24 from bottom: 1854 is correct, not 1853.
p. 347, LC, L 27 from bottom: 1908 is correct, not 1910.
p. 367, LC, L 27: 1812 is correct, not 1811.
p. 368, LC, L 23, 27 & 43: 1812 is correct, not 1811. [Make same changes for *latro* and its synonym *armiger*; *bellicosus* under *lineatus*; *pugnax* under *mucronatus*; *nigripes* under *trispinosus*; and *pygmaeus* under *uniglumis*.]
p. 370, LC, add to nomina nuda: *sericeomarginatus* "Kohl" Ferton, 1912.
p. 393, LC, L 4: (Po) is correct, not (?).
p. 393, LC, L 6 from bottom: (Pa) is correct, not (?).
p. 393, RC, L 3: (Pa) is correct, not (E).
p. 393, RC, L 6: (Pa) is correct, not (?).
p. 393, RC, L 12: (Pa) is correct, not (E).
p. 469, LC, L 20 from bottom: 1812 is correct, not 1811.
p. 469, RC, L 17, 20 & 35: 1812 is correct, not 1811.
p. 470, LC, L 3 & 16: 1812 is correct, not 1811.
p. 473, RC, L 6: 1908 is correct, not 1910.
p. 473, RC, L 13: 1812 is correct, not 1811.
p. 475, RC, L 1: 1812 is correct, not 1811.
p. 489, LC, Last L: Temuco is correct, not Tenuco.
p. 495, LC, L 2: 1838 is correct, not 1837.
p. 502, RC, L 4 from bottom: (1969a,b) is correct, not (1968e, 1969).
p. 506, RC, L 13 from bottom: *sericatus* belongs in *Sagenista* according to Vardy (in litt.), who examined the type. Transfer to p. 522, RC.
p. 511, fig. 172 C: *Ammatomus* is correct.
p. 519, caption for fig. 178: transpose information for E and F (E shows gastral segments and F shows metapleural area).
p. 523, LC, L 20 from bottom: (fig. 159 O) is correct.

p. 526, RC: in **Sphecos** 24 I inserted *cincta* (F.). Change spelling to *cinctus*.
p. 527, LC, L 6: *kohlii* is a synonym of *ferrugineus* [transfer to p. 526, RC, after L 22 from bottom].
p. 530, RC, L 18 from bottom: 1908 is correct, not 1910.
p. 531, RC, L 13: 1941 is correct, not 1945.
p. 532, LC, L 8: 1941 is correct, not 1945.
p. 538, LC, L 25: *meliloti* Rohwer in Johnson and Rohwer... is correct.
p. 545, RC, L 15 from bottom: South Africa is correct, not Ethiopia.
p. 546, LC, insert as species after L 1: *comantis* J. Parker, 1929; Brazil.
p. 546, LC, insert after L 14 from bottom as synonym: *inimica* "Kohl" Ferton, 1912; nomen nudum.
p. 546, LC, L 8 from bottom: 1908 is correct, not 1910. Also *massaica* is a valid species from Tanzania. Transfer to p. 547.
p. 546, LC, L 8 from bottom: *massaica* Cameron, 1908; Kenya, is a good species. Transfer to p. 547, LC, L 20.
p. 547, LC, L 10: *laeta* is a synonym of *intermedia*. Transfer to p. 548, LC, and enter after L 15.
p. 547, LC, L 19: 1908 is correct, not 1910, distribution should read Kenya.
p. 548, LC, L 20: 1908 is correct, not 1910, distribution should read Kenya.
p. 548, RC, L 30: Pakistan is correct, not India.
p. 548, RC, L 24: *stenebdoma* is correct spelling. [The spelling *stenobdoma* occurred on p. 94 of Parker, 1917. The spelling *stenebdoma* is in the key on page 79, and in the index, p. 154. Under the provisions of Art. 32 of the Code, Parker, 1929:83, validly selected *stenebdoma* as the correct spelling.]
p. 564, RC, L 24: *bimacula* is correct.
p. 565, RC, L 34: *nigriceps* is not a sphecid according to Vardy (in litt.), who examined the type. It is a bee in the genus *Psaenythia*. The type locality is probably Brazilian, not India.
p. 565, footnote: change *bimaculus* to *bimacula* (3 places).
p. 580, RC, L 9: Kenya is correct, not Tanzania.
p. 596, RC, L 7 from bottom: 1969a is correct, not 1968e.
p. 596, RC, L 4 from bottom: 1969b is correct.

ERRATA ERRORS

Woj Pulawski found the following mistake in Big Blue Book Errata, part 18, in **Sphecos** 23:15:

Change lines 1-5 at the top of the right column in Sphecos that reads: "p. 426 . . . ." etc. as follows:
p. 426, LC, L 36: delete entire line [synonymy was established by Leclercq, 1974:284].

Errata 19 Errata

p. 426, LC, L 22 (should read: L 22 from bottom).
p. 469, LC, L 22 (should read: L 22 from bottom). Information given was not sufficiently clear. Change entry as follows: "*decemnotatus* A. Costa, 1869" of Dalla Torre, 1897, p. 569 (lapsus for *decemmacutalus* Spinola, 1807).
p. 495, LC, L 2: is correct (not L1).
p. 526, RC, insert as species after L 8: *cinctus* is correct spelling (not *cincta*).

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FLORENCE CENTER FOR THE HISTORY AND PHILOSOPHY OF SCIENCE

INTERNATIONAL WORKSHOP

Natural History and Evolution of an Animal Society: the Paper-Wasp case.

Castglioncello (LI), Italy, October 4-7 1993.

PRELIMINARY PROGRAM

October 4

9.00-13.00
Introduction
"Polistes: Analysis of a Society" by **Leo Pardi**

Phylogeny and Systematics
J. Carpenter (American Museum of N.H., New York, USA): Phylogeny and Biogeography of *Polistes*.
J. Wenzel (American Museum of N.H., New York, USA): Evolution of Nest Architecture in *Polistes* Wasps.

15.00- 19.00
General Life Histories
S. Yamane (Ibaraki University, Mito, Japan): Ecological Factors Influencing the Colonial Cycle in *Polistes* Wasps.
R. Cervo (Univ. of Florence, Italy); Social Parasitism and its Evolution in *Polistes*.
L. Beani (Univ. of Florence, Italy): Mating Systems in *Polistes* Wasps.
A. Ugolini (Univ. of Florence, Italy): Homing Mechanisms in Wasps.
21.00 **Round Table**

October 5

9.00-13.00
Social Organization
A. Strambi (C.N.R.S. Marseille, France): Physiological Control of Reproduction.
R.L. Jeanne (Univ. of Wisconsin, USA): Glands and Behaviour.
G. Gamboa (Oakland Univ., USA): Nestmate Recognition.
M.C. Lorenzi (Univ. of Turin, Italy): The Role of Cuticular Hydrocarbons in Colonial Organization.
15.00-19.00 **Round Table**
21.00 **Round Table**

October 6

9.00-13.00
Evolution of Sociality
J. Strassmann (Rice University, Houston, USA): Relatedness Between Nest Foundresses and the Origin of Sociality in *Polistes*.
J. Gervet (C.N.R.S. Marseille, France): Behavioural Screening and Selection through Affinity: The Case of Polygyny in Paper Wasps.
D. Queller (Rice University, Houston, USA): Demographic Advantages of Sociality in *Polistes*.

15.00-18.00
S. Turillazzi (Univ. of Florence, Italy): Other *Polistes*-like Wasp Societies: Social Evolution in Stenogastrinae and *Belonogaster*.
R. Gadagkar (Indian Inst. Science, Bangalore, India): Other *Polistes*-like Societies: Social Evolution in *Ropalidia* and *Mischocyttarus*.
F. Dessì Fulgheri (Univ. of Florence, Italy): Analogies between *Polistes* and Vertebrate Sociality.
21.00 **Round Table**

October 7

9.00-13.00
Comparative Studies
M.J. West-Eberhard (Smithsonian Inst. Costa Rica): The Wasp World as a Microcosm Showing the Role of Flexibility in Evolution.
W. Hamilton (Univ. of Oxford, UK): Learning from Gifted Insects.
P. Harvey (Univ. of Oxford, UK): The limits of Comparative Method.
R. Burian (Virginia Tech., Blacksburg, USA): Model Organisms and Research in Evolutionary Biology.
15.00-19.00 **Round Table:** The influence of Paper Wasps (and Students of Wasps) on the History of Comparative Evolutionary Studies of Social Behaviour.

General Conclusions

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RECENT LITERATURE

(Worth a look: Gibson, 1993, Wolf, 1992b.)

Achterberg, C. van
1992. Obituary and bibliography of Jacobus van der Vecht (1906-1992). Zool. Med. Leiden 66(16):295-302.
1992. Obituary and bibliography of Gerard van Rossem (1919-1990). Zool. Med. Leiden 66(17):303-308.
1992. Obituary and bibliography of Hermanus Gerardus Maria Teunissen (1914-1992). Zool. Med. Leiden 66(18):309-311.

Akre, Roger D., Elizakbeth A. Myhre and Yi Chen
1993. A huge nest of the common yellowjacket, *Paravespula vulgaris* (Hymenoptera: Vespidae), in California. Ent. News 104(3):123-128.

Antropov, A.V.
1992. Five new neotropical species of the genus *Spilomena* (Hymenoptera Sphecidae Pemphredoninae), with additional comments on the previously described species. Russian Entomol. J. 1(1):67-73.
1992. Book Review. The chrysidid wasps of the world. By Lynn S. Kimsey and Richard M. Bohart. Oxford University Press, Oxford, New York, Toronto. 1990. I-XI + 652 pp. Russian Entomol. J. 1(1):91-96. (in Russian)
1993. Further supplements to the knowledge of the neotropical fauna of digger wasps of the genus *Spilomena* Shuckard (Hymenoptera Sphecidae Pempredoninae). Russian Entomol. J. 1(2):41-57.
1993. The species of the tribe Trypoxylini (Hymenoptera Sphecidae) collected in Central Africa. Russian Entomol. J. 2(1):53-55.
1993. *Alinia carinata* gen. et sp. n. – a new representative of the tribe Crabronini (Hymenoptera, Sphecidae) from South America. Entomol. Obozr. 72(1):190-193.

Archer, M.E.
1993. Notable wasps and bees (Hym., Aculeata) taken on Jersey and Sark. Ent. Mon. Mag. 128:45-47.

Asís, Josep D., Severiano F. Gayubo and José Tormos
1993. The larva of *Psenulus schencki*, with some remarks on the larval characters of Pemphredonini (Hymenoptera: Sphecidae: Pemphredoninae). Ann. Soc. Entomol. Fr. (N.S.) 29(1):55-60.

Barbier, Yvan, Pierre Rasmont and Raymond Wahis
1990. Aperçu de la faune des Hyménoptères Vespiformes de deus terrils du Hainaut occidental (Belgique). Notes Fauniques de Gembloux (21):23-38.

Barrat, John
1993. Sri Lankan wasps supply rich treasure trove for study. Smithsonian Inst. Res. Rep. (71):5.

Bohart, Richard M.
1993. South American *Oxybelus* I. Notes on types of Spinola, F. Smith, Brèthes. Pate, and Schrottky (Hymenoptera, Sphecidae, Crabroninae). Insecta Mundi 6(3):189-191. (cover date 1992)

Bousquet, Yves
1993. On Thomas Say's entomological publications printed in New Harmony, Indiana. Ent. News 104(1):1-14.

Brockmann, H. Jane
1993. Parasitizing conspecifics: comparisons between Hymenoptera and birds. Trends in Ecology and Evolution 8(1):2-3.

Budrys, E. R. and V. L Kazenas
199. New species of digger wasps of the genus *Diodontus* (Hymenoptera, Sphecidae). Zool. Zh. 71(8):24-32.

Butts, Douglas P., Michael A. Camann and Karl E. Espelie
1993. Discriminant analysis of cuticular hydrocarbons of the baldfaced hornet, *Dolichovespula maculata* (Hymenoptera: Vespidae). Sociobiology 21 (2):193-201.

Callan, E. McC.
1993. Biological notes on some *Tachytes* and *Tachysphex* species (Hym., Sphecidae) in Trinidad. Ent. Mon. Mag. 128:41-43.
1993. Nesting behaviour of *Paralastor debilitatus* Perkins (Hymenoptera: Vespidae: Eumeninae) preying on weevil larvae in Australia. Entomologist 112(2):95-98.

Chilcutt, Charles F. and David P. Cowan
1993. Methods for artificial rearing of solitary eumenid wasps (Hymenoptera: Vespidae: Eumeninae). Great Lakes Ent. 26(1):15-19.

Castro, L.
1992. Sobre los Euménidos (Hym., Vespoidea) del valle medio del Ebro. Zapateri Revta. aragon. ent. 1(2):21-34.

Cooper, M.
1993. Two new species of *Polybia* (Hym., Vespidae) with notes on other members of the genus. Ent. Mon. Mag. 128:31-38.

Evans, Howard E.
1993. Book Review. Thomas Say: new world naturalist. Patricia Tyson Stroud. 1992. University of Pennsylvania Press, Philadelphia, 340. pp. $24.95. Ent. News 104(1): 15-16.

Field, Jeremy
1993. Nesting biology of the solitary digger wasp *Podalonia affinis* (K.) (Hymenoptera: Sphecidae). The Entomologist 112(1):17-24.

Fricke, John M.
1993. Aphid prey of *Passaloecus cuspidatus* (Hymenoptera: Sphecidae). Great Lakes Ent. 26(1):31-34.

Fritz, Manfredo A. and Guido Pagliano
1993. Sobre *Lophomutilla* Mickel y *Pertyella* Mickel. Boll. Soc. ent. ital., Genova 124(3):209-220.

Gayubo, Severiano F., José Tormos and Josep D. Asís
1993. New or little-known sphecid wasps for the Iberian peninsula (Hymenoptera Sphecidae). Boll. Soc. ent. ital., Genova 124(3):201-208.

Genaro, Julio Antonio and Coralia S. Sánchez
1993. Conducta de nidificación de *Cerceris cerverae*, *C. cubensis* y *C. festiva* en Cuba (Hymenoptera: Sphecidae). Carribbean J. Sci. 29(1-2): 39-43.

Genise, Jorge F.
1992. Las especies conocidas de Tiphiidae (Hym. Tiphioidea) de la Argentina y paises vecinos. Revta Soc. ent. argent. 50(1-4):277-329.
1992. Las especies del genero *Scolia* de la Argentina(Hymenoptera, Scoliidae). Physis, Secc. C, 47(113):61-66.

Genise, Jorge F. T. M. Bown
1991. A reassessment of the ichnofossil Chubutolithes gaimanensis Bown and Ratcliffe: Reply. J. Paleont. 65(4):705-706.

Gess, Sarah K.
1992. Biogeography of the masarine wasps (Hymenoptera: Vespidae: Masarinae), with particular emphasis on the southern African taxa and on correlations between masarine and forage plant distributions. J. Biogeogr. 19:491-503.

Gibson, Gary A.P.
1993. Groundplan structure and homology of the pleuron in Hymenoptera based on a comparison of the skeletomusculature of Xyelidae (Hymenoptera) and Raphidiidae (Neuroptera). Mem. Ent. Soc. Can. 165:165-187.

Gusenleitner, J.
1992. Funddaten von Eumeniden und Marasiden aus Elfenbeinküste, Ghana, Mali, Senegal und Togo (Hymenoptera, Vespoidea, Eumenidae und Masaridae). Linzer biol. Beitr. 24(2):671-682.
1992. Neue und bemerkenswerte Grabwespenfunde fur Österreich (Hymenoptera, Sphecidae). Linzer biol. Beitr. 24(2):683-689.
1992. Zwei neue Eumeniden-Arten aus dem aethiopischen Raum (Hymenoptera, Vespoidea, Eumenidae). Linzer biol. Beitr. 24(2):851-856.
1992. Zwei neue Eumeniden-Gattungen und -Arten aus Madagaskar (Vespoidea, Hymenoptera). Linzer biol. Beitr. 24(2):931.
1992. Drei neue paläarktische Eumeniden-Arten(Hymenoptera, Vespoidea). Linzer biol. Beitr. 25(1):43-50.

Heinrich, Bernd
1993. The hot-blooded insects. Strategies and mechanisms of thermoregulation. Harvard Univ. Press, Cambridge, Massachusetts. 601 p. (Chapter 10, p. 334-342: Wasps and the heat of battle)

Karsai, I. and Z. Vajda
1991. Characteristics of spiders captured by *Anoplius viaticus paganus* Dahlb. Proc. 4th ECE/XIII SIEEC, Godollo 1991, pp. 504-509.

Kazenas, V.L.
1992. New species of digger wasps of the genus *Harpactus* Shuckard (Hymenoptera, Sphecidae) from Kazakhstan and Uzbekistan. Ent. Obozr. 72 (3):640-645. (in Russian with English summary)

Kuhlmann, Michael
1993. Nachweis von *Stenodynerus steckianus* (Schulthess, 1897) (Hymenoptera, Eumenidae) in Westfalen. Mitt. Arb-Gem. ostwestf.-lipp. Ent. 9 (1):31.

Kuhlmann, Michael, Hans Retzlaff, Werner Schulze & Heinrich Wolf
1991. Zur Hautflüglerfauna (Hymenoptera) der Senne. II. Eumenidae, Pompilidae, Sphecidae, Apidae (Insektenfauna und Ökologie der Binnendünen in der südlichen Senne. V. Teil). Mitt. ArbGem. ostwestf.-lipp. Ent. 7(3):81-122.

Kurczewski, Frank E.
1993. New prey for *Crabro advena* (Hymenoptera: Sphecidae). Great Lakes Ent. 26(1):15-19.

Leclercq, Jean
1991. Le crabronien *Rhopalum (Corynopus) beaumonti* Moczar 1957 en Hongrie et en Autriche (Hymenoptera, Sphecidae). Lambillionea 91(2): 103-105.
1993. Nids de *Pemphredon montana* Dahlbom, 1845 (Hymenoptera, Sphecidae). Bull. Annls Soc. r. belge Ent. 128:285-287.

Low, Bobbi S. and William T. Wcislo
1992. Male foretibial plates and mating in *Crabro cribrellifer* (Packard) (Hymenoptera: Sphecidae), with a survey of expanded male forelegs in Apoidea. Ann. Ent. Soc. Amer. 85(2):219-223.

Luchetti, Damiano
1993. Note su *Latibulus argiolus* parassitoide di alcune specie di *Polistes* (Hymenoptera, Ichneumonidae, Vespidae). Boll. Ass. Romana Entomol. 47:99-102.

Martin, Stephen J.
1992. Colony failure in the social wasp *Vespa affinis* (Hymenoptera, Vespidae). Jpn. J. Ent. 60(4):671-681.

Mead, F. and D. Gabouriaut
1993. Post-eclosion sensitivity to social context in *Polistes dominulus* Christ females (Hymenoptera, Vespidae). Ins. Soc. 40:11-20.
Melo, Gabriel Augusto R. de and Lucio Antonio de O. Campos
1993. Trophallaxis in a primitively social sphecid wasp. Ins. Soc. 40:107-109.
Melo, Gabriel Augusto R. de and Howard E. Evans
1993. Two new *Microstigmus* species (Hymenoptera, Sphecidae), with the description of their parasite, *Goniozus microstigmi* sp. n. (Hymenoptera, Bethylidae). Proc. Ent. Soc. Wash. 95(2):258-263.
Mochi, Alessandro and Damiano Luchetti
1993. Note faunistche su alcuni sfecidi italiani (Hymenotpera). Boll. Ass. Romana Entomol. 47:103-107.
Nemkov, P.G.
1992. Digger wasps of the tribe Gorytini (Hymenoptera, Sphecidae) of the fauna of Russia and neighbouring countries. The genera *Lestiphorus* Lepeletier, *Oryttus* Spinola and *Olgia* Radoszkowski. Ent. Obozr. 71(4): 935-949. (in Russian with English summary)
Nishida, Gordon M.
1992. Hawaiian terrestrial arthropod checklist. Bishop Museum Technical Report No. [1] viii + 262 p.
O'Donnell, Sean
1993. Interactions of predaceous katydids (Orthoptera: Tettigoniidae) with neotropical social wasps (Hymenoptera: Vespidae): are wasps a defense mechanism or prey? Ent. News 104(1):39-42.
Olmi, Massimo
1992. Contribution to the knowledge of the Gonatopodinae (Hymenoptera Dryinidae). Boll. Ist. Ent. "G. Grandi" Univ. Bologna 46:109-122.
1992. Dryinidae of the Aggtelek National Park (Hymenoptera: Chrysidoidea). Folia Ent. Hung. 53:127-128.
1992. New records of Dryinidae from Nicaragua and a description of a new species (Hymenoptera: Chrysidoidea). Rev. Nica. Ent. 21:26-30.
1992. New species of Dryinidae (Hymenoptera). Acta Zool. Hung. 38(3-4):281-292.
1993. Descriptions of new taxa of Dryinidae (Hymenoptera Chrysidoidea). Frustula Entomologica n.s. 15(28):19-62. (cover date 1992)
1993. Dryinidae de Costa Rica: Catalogo e considerazioni biogeografiche ed evolutive (Hymenoptera Chrysidoidea). Boll. Soc. ent. ital., Genova 124 (3):186-200.
Pagliano, Guido
1992. *Sceliphron caementarium* (Drury) (Hymenoptera: Sphecidae) specie nuova della penisola italiana. HY-MEN (3):5.
1992. Nyssoninae italiani (Hymenoptera: Sphecidae). Parte I. Boll. Mus. reg. Sci. nat. Torino 10(1):21-50.
Pires-O'Brien, Maria Joaquina
1993. An essay on the history of natural history in Brazil, 1500-1900. Arch. Nat. Hist. 20(1):37-48.
Poinar, George O., Jr.
1993. Insects in amber. Annu. Rev. Entomol. 46:145-159.
Pomonarenko, N.G.
1992. On fauna of dryinids (Hymenoptera, Dryinidae) of Siberia and Far East. Entomol. Obozr. 71(4):929-934. (in Russian with English summary)
Pulawski, Wojciech J.
1992. A review of *Eremiasphecium* Kohl, 1897. Entomofauna 13(24):397-408.
Quicke, Donald L.J., Simon N. Ingram, Helen S. Baillie and Pauline V. Gaitens
1992. Sperm structure and ultrastructure in the Hymenoptera (Insects). Zool. Scripta 21(4):381-402.
Scaramozzino, Pier Luigi
1992. In Argentina a caccia di *Dynatus*. HY-MEN (3):5-6.
Schmidt-Egger, Christian and Heinrich Wolf
1992. Die Wegwespen Baden-Württembergs (Hymenoptera, Pompilidae). Veroff. Naturschutz Landschaftspflege Bad.-Wurtt. 67:267-370.
Shimizu, Akira
1992. Nesting behavior of the semi-aquatic spider wasp, *Anoplius eous*, which transports its prey on the surface film of water (Hymenoptera, Pompilidae). J. Ethology 10(2):85-102.
Sinha, A., S. Permnath, K. Chandrashekara and Raghavendra Gadagkar
1993. *Ropalidia rufoplagiata*: a polistine wasp society probably lacking permanent reproductive division of labour. Ins. Soc. 40:69-86.
Strassmann, Joan E., Karin R. Gastreich, David C. Queller and Colin R. Hughes
1992. Demographic and genetic evidence for cyclical changes in queen number in a neotropical wasp, *Polybia emaciata*. Amer. Nat. 140(3):363-372.
Strumia, Franco
1992. *Chrysis paglianoi* sp. n. (Hymenoptera Chrysididae) from Sardina Island. Frustula entomol. n.s. 15(28):133-142.
Suzuki, Tadashi and M. Ramesh
1992. Colony founding in the social wasp, *Polistes stigma* (Hymenoptera Vespidae), in India. Ethol. Ecol. and Evol. 4:333-341.
Tsuneki, K.
1993. Corrigenda et Addenda. Spec. Publ. Japan Hymen. Assoc. (41):38. (for issues 39 and 40)
1993. On some Taiwanese Mutillidae, collected in 1976, by Mr. T. Murota, with descriptions of new taxa (Hymenoptera). Spec. Publ. Japan Hymen. Assoc. (41):39-50.
1993. A new and an unrecorded species of Mutillidae from Is. Okinawa, the Ryukyus (Hymenoptera). Spec. Publ. Japan Hymen. Assoc. (41):51-55.
1993. Opposing opinion against the new genus *Petersenidia* Lelej, 1992 (Mutillidae, Hym.). Spec. Publ. Japan Hymen. Assoc. (41):56-59.
Tsuneki, K., C. Nozaka, T. Tano, H. Kurokawa and T. Murota
1993. Mutillidae recently collected in the Philippines (Hymenoptera). Spec. Publ. Japan Hymen. Assoc. (41):1-38.
Wolf, Heinrich
1991. Körperbau und Lebensweise unserer Sozialen Wespen als Ergebnis der Evolution. Verh. Westd. Entom. Tag. 1990:45-54.
1992. Zwitter von *Tachysphex pompiliformis* (Panzer) (Hym., Sphecidae) und *Trachusa byssina* (Panzer) (Hym., Apidae). Linzer biol. Beitr. 24 (1):29-30.
1992. Bestimmungsschlussel für die Gattungen und Untergattungen der westpaläarktischen Wegwespen (Hymenoptera: Pompilidae). Mitt. Internat. Ent. Ver. 17(2):45-119.
1992. Beinen und Wespen als Bewohner eines Waldran-des. II. (Hym., Aculeata). Mitt. ArbGem. ostwestf.-lipp. Ent. 8(3):85-95.
Zhang Jun-feng
1992. Descriptions of two new genera and two new species of Baissodidae from China (Sphecoidea, Hymenoptera). Acta Ent. Sinica 35(4):483-489.

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Increasing attention has been focused on biodiversity in recent years, based on a number of arguments to justify the conservaton of the world's flora and fauna. Such arguments may be economic – that species may have potential for food or medicine – or ecological – that the extinction of any species affects the overall ecological balance. Little attention, however, has been focused on which groups have the greatest impact on maintaining diversity.

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