CHALCID FORUM

No. 3 JUNE 1984

A Forum to Promote Communication Among Chalcid Workers

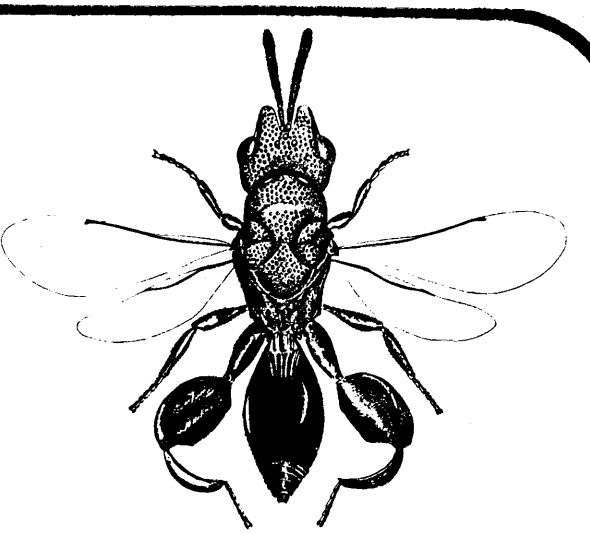
EDITORS:

E. E. Grissell

Michael E. Schauff

Gary Gibson

Mailing Address:
Systematic Entomology Laboratory
USDA, ARS, c/o U. S. National
Museum, Washington, D. C. 20560



Dirhinus sp.

EDITORS' NOTES

Since the second issue of the FORUM, we have continued to receive a favorable response and we now have received questionaires from about half of the people on our list. The list is still growing. We would like to thank those of you who have responded and encourage the rest to let us hear from you. In addition, we would ask that readers continue to contribute. We know that it is not always easy to sit down and write something, but we really need your help to keep the forum going. You need not have anything "earthshaking" to say, although that would be welcome too. We would especially welcome any news relating to collecting and museum trips. Although the particular trip may seem dull, routine, and mundane to you it may actually be exciting to some of us who never go anywhere or who want to know a good place to go.

We are not reprinting the full mailing list for this issue. Instead, we are including only additions and corrections to the list published in FORUM No. 2.

Our thanks to G. Prinsloo for the drawing of Dirhinus for this issue's masthead.

TECHNIQUES

(G. A. P. Gibson)

MOUNTING SPECIMENS.-- John LaSalle writes that he uses a method of point mounting specimens which he adopted from various European workers. The specimen is glued to the point in the traditional manner, that is, by the pleuron, and the point is then bent upwards at its middle to about a 45 degree angle. A retangular card (such as used for card mounting) is pinned directly below the point so that the bases touch. The card functions to protect the point mounted specimen, provides a nice white background during study and can be rotated aside if the ventral surface of the insect has to be seen. [John's mounts of tanaostigmatids prove this to be a superior method; I particularly like the white background when examining specimens--GAPG].

VIEWING SPECIMENS.-- Specimen glare which obscures fine surface sculpture and causes eye strain is produced by high intensity incandescent microscope light sources. Glare and the problems associated with it are considerably reduced by inserting a piece of mylar drawing film between the specimens and light source. Since the film acts like frosted glass to diffuse the light source, best results are obtained by positioning it as close to the specimen as is safe. A piece of plasticene can be used as a base to hold it and this moved as required, or the film can be affixed to cork or wooden viewing blocks by glue or by making a slit along the edge of the block for the film. Lubomir Masner has championed this trick for proctotrupoids (see PROCTOS, Vol. 5, 1982), but it should be used by anyone using incandescent light sources.

SCANNING ELECTRON MICROSCOPY. -- As promised in the previous newsletter, here are a few hints for preparing specimens for SEM and producing reasonable pictures. Most of these are self evident, but hopefully are worth noting and repeating.

Specimens: It goes without saying that quality of output is dependent on quality of input. Good results can not be expected from shriveled masses of cuticle. If only such specimens are available then line drawings are far superior to SEM's because structure can be "reconstructed". Quality of SEM's, collections, and study of chalcidoids in general should increase in the future because of the critical point drier [for more info on this, see: Gordh, G. and J. Hall. 1979. A critical point drier used as a method of mounting insects from alcohol. Ent. News. 90:57-59. Eds.]. This relatively recent technique is probably the most important development ever for the study of thin cuticled insects such as many chalcidoids that tend to shrivel during air drying. Critical point drying is not only necessary for delicate specimens, but also makes possible SEM study of internal systems. I have been studying muscle systems of Hymenoptera and making gross dissections in alcohol. Critical point drying the dissections results in the muscles retaining their original shape and sites of attachment which can be studied using the high magnification of SEM. Consecutive concentrations to 100% alcohol is generally sufficient for most specimens prior to critical point drying, but for muscle work or very delicate specimens I prefer increasing concentrations of amyl acetate:alcohol (40%, 60%, 75%, 96%, 100% amyl acetate) which results in even less shrinkage.

Cleaning specimens: Dirty or greasy specimens can be cleansed by soaking in a 1:1 solution of ammonium hydoxide and water. I use the solution to rehydrate previously dried specimens and reconstitute muscles prior to dissection. Excessive hydration results in expansion of thin cuticled specimens such that shrivelled individuals reattain a more natural habitus. This can be preserved to some extent by subsequent critical point drying. Thicker cuticled specimens which do not collapse during air drying can be cleaned as above, but before air drying they should be dehydrated in alcohol and soaked in chloroform. This latter chemical also cleanses specimens of grease, but more importantly is highly volatile so that it evaporates very quickly. Rapid evaporation results in setae sticking out in a natural condition rather than adhering to the cuticle as often happens if dired out of alcohol. Strongly constructed individuals can also be cleaned using these solutions and an ultrasonic cleaner. Once dried and mounted on an SEM stub final cleaning is effected using God's gift to SEM'ers, paper backed double sided sticky tape. This commercially available (we get our's from the '3M' company) tape is produced as an adhesive for mounting specimens on SEM stubs, but is even more important for cleaning specimens. The point of a mounting or minuten pin, inserted into a handle for easy handling is scratched across the surface of the sticky tape to pick up a small amount of adhesive on the point. Minute particles of dirt can then be plucked from the surface with the adhesive. When illustrating structure by SEM I do not like setae in the photograph because they distract from the essential features being illustrated. Setae can be removed with a pin and adhesive by rubbing the pin tip back and forth over the setae. To clean specimens without removing the setae the pin and adhesive should only be rubbed in the direction the setae are lying. This technique is also essential to clean critical point dried dissections for SEM examination of internal structures. By using various

size pins with sticky tape adhesive at the tip, fatty material, overlying muscle tissue, tracheoles, etc., can be plucked from the surfaces you wish to examine. If careful, sites of muscle insertion or state of the target tissue are not affected because no pressure is actually applied to them.

Mounting specimens: Before mounting anything on an SEM stub one needs some sort of holder for the small stub so that it can be easily manipulated. I use the type of polyethylene stopper for shell vials which have an inner column that inserts into the vial. The one I use has a top diameter of 2.7 cm, a column diam. of 2.0 cm and a depth of 1.7 cm. The stopper is flipped upside down so that the 'top' forms the base and a small hole is cut into the 'bottom' of the column for the prong of the SEM stub. I particularly like these stoppers because the top (base of the holder) has a ridged outer surface which affords a good grip and the inner column makes a raised stage which gets the stub away from my clumsy fingers.

Double sided sticky tape applied to the SEM stub allows one to securely attach the specimens to the stub in the position you want to view it. Antennae, wings and leg parts are prone to charging because they typically are poorly grounded and the charging results in streaks across the picture. To avoid this all appendages should be removed prior to mounting the specimen. If appendages are to be scanned they should be mounted and grounded as independent structures from the body itself. Silver conducting paint is used to ground specimens and I prefer a thick paste of this so that I can put a 'glob' of paint on the desk beside my microscope. Using a fine brush (000) and chloroform I dilute the silver paint to the desired consistancy so that it readily adheres to the specimen, but is not so liquid that it is drawn up over the specimen by capillary action. All segments or articulated parts of a specimen should be grounded to the stub by silver paint.

Preferably, specimens should be mounted on the stub itself to ensure proper grounding. If one wants dorsal, pleural and ventral views and is only willing to sacrifice one specimen then it can be point mounted in the traditional manner by the pleuron. The point is bent at a right angle near the specimen so that most of the point is stuck to the stub and the specimen sticks pleural surface upwards into the air. The point should be covered by silver paint and this extended to the pleuron to ground the specimen. By scanning one surface at a time and then rebending the point all three surfaces can be scanned. For heads, I like to detach these from the body and glue the apex of a point to the occipital foramen. I use silver paint rather than glue to do this to ensure proper grounding. The point is then bent at a 45 degree angle near the head and the base stuck to the SEM stub. With a little practice even very small heads can be mounted this way. The advantage is that the head is sticking up off the stub so that various angles can be scanned.

Gold coating specimens: Two types of gold coaters are commonly used, a 'sputter coater' and what is known as either an 'evaporator' or a 'shadow caster.' The sputter coater is the far superior of the two because it ionizes gold from a target and evenly coats all surfaces. The evaporator merely melts and evaporates a strand of gold wire so that only those surfaces in a direct line to the source are coated. If the specimen is convex the under surfaces will remain uncoated (thus the term shadow caster) and charging will result. This problem is reduced if the stubs are rotated in an epicyclic rotator which both rotates and revolves the stubs during evaporation so that all surfaces are exposed to the source.

Scanning specimens: Results obtained will depend on the SEM being used and the experience of the operator. Highly important for good results, however, is the 'gamma control'. I really do not understand how this acutally works, but it is used to reduce the difference between light and dark areas in a picture. Anyone who has used an SEM known that when a convex surface is scanned the resulting picture is not equally exposed. Rather, the edges are variously light or dark depending on the angle and direction of the surface to the collector. If extreme, these areas print out as completely white or black.

One averages the white and dark areas with the gamma control so that the differences are less extreme and detail is seen in all parts of the picture. Use of the gamma decreases the contrast and if used to excess the picture can look 'washed out'. Furthermore, the gamma control works on a logaritmic scale so that initial revolutions of the control produce greater compensatory results than do subsequent revolutions.

Printing pictures: The final product, good SEM pictures, requires an equal effort at each stage of the procedure. One should not forget the importance of printing since all previous efforts can be negated by poor quality prints, but care in printing can also make mediocre shots into good pictures. Unequally light and dark areas as discussed above can also be compensated for in printing by 'burning in' light regions and 'shading' the dark regions. Using some object between the lens of the enlarger and the photographic paper one varies the time of exposure between different parts of the picture. Although a very simple technique with a little paractice it is very effective. I find that one's hand is generally sufficient to burn in or shade almost any size and shaped region since the hand can be formed into an incredible number of shapes and size is varied by the distance it is held from the lens. In some instances cut outs of stiff paper can be used to shade complex regions. To avoid a noticeable line between the shaded and unshaded regions the hand or cut out should not be kept stationary, but in a very slight and continual vibrating motion.

Any one who has additional comments or questions about the techniques discussed above please write and I will include them in the next newsletter.

FORUM

IN A FOG: The following information is provided by John Noyes (the title should thus be self-explanatory):

I recently sorted through some canopy fogging samples collected by Nigel Stork (of the BMNH) in Brunei and thought the results might prompt some response from other chalcid workers. The samples were collected using similar techniques to those used by Terry Irwin of the USNM except that they were not collected onto suspended 1 metre square trays but onto large polythene sheets laid on the ground. Most of the chalcid material collected using this method was in reasonably good condition, but some of it was badly damaged and useless for taxonomic studies. Estimates of the number of chalcid species collected for each family are set out below.

Family	Specimens collected	% of total	estimated # of species	% of total	% of total # known species in world (from Noyes, 1978)
Agaonidae	16	1.11	14	1.92	2.19
Aphelinidae	250	17.41	146	19.98	4.87
Chalcididae	7	0.49	3	0.41	8.52
Elasmidae	10	0.70	6	0.82	1.34
Encyrtidae	296	20.61	170	23.25	16.69
Eucharitidae	7	0.49	1	0.14	2.00
Eulophidae	512	35.65	229	31.32	17.93
Eupelmidae	105	7.31	41	5.61	4.26
Eurytomidae	23	1.60	13	1.77	6.43
Mymaridae	57	3.97	36	4.92	7.02
Ormyridae	4	0.28	2	0.27	0.32
Pteromalidae	61	4.25	32	4.38	18.26
Signiphoridae	2	0.14	1	0.14	0.45
Tanaostigmatidae	5	0.35	3	0.41	0.20
Torymidae	70	4.94	24	3.28	5.89
Trichogrammatidae	11	0.77	10	1.37	2.65
Total	1436		731		

It may be that many of the smaller chalcids were carried away from the sampling area by the up-currents of air which are created as the forest warms up in the early morning sun, when the sampling was done. Therefore it is possible that the numbers of specimens and therefore species in the canopy in the areas sampled were proportionately greater in relation to the heavier insects such as beetles and ants.

The striking thing about the numbers given in the above table is the amazingly high proportion of species of Aphelinidae and the relatively small proportion of species of Pteromalidae.

These figures can be compared with estimates of the number of species and specimens of Proctotrupoidea and Ceraphronoidea collected in the same samples, i.e. 146 specimens, 56 species. Nigel Stork estimates that the same samples contained approximately 800 species of Coleoptera. Terry Irwin (1982) suggest that there might be as many as 30,000,000 species of tropical arthropods. If the proportion of beetles to other arthropods remains the same then we might expect there to be about 10,000,000 species of beetles making up this number. This leaves me pondering. If we extrapolate from Nigel Stork's sampling (which is about as legitimate as the way that Terry Irwin arrived at his figure) for other tropical areas, could we expect, in the final reckoning, that there could be about 10,000,000 species of tropical chalcids? The mind boggles!!

Irwin, T. L. 1982. Tropical forests: their richness in Coleoptera and other arthropod species. The Coleopterists Bulletin 36:74-75.

Noyes, J. S. 1978. On the numbers of genera and species of Chalcidoidea in the world. Entomologist's Gazette 29:163-164.

ETCETERA

NEWSLETTER NEWS: Association of Pacific Systematists Newsletter No. 1 (March 1984). A new newsletter has just been issued which could be of interest to some readers. The information is as follows: "The Association of Pacific Sytematists was officially formed at the XV Pacific Science Congress held in Dunedin, New Zealand in February of 1983. The dues structure has been determined to be U. S. $5.00. The Association is an organization for and by systematists in the Pacific. News concerning research efforts and opportunities in the Pacific will be an area of prime focus. The dues will help defray the cost of handling and mailing the Newsletter." For further information contact: S. H. Sohmer, Chairman, Department of Botany, Bernice P. Bishop Museum, P.O. Box 19,000-A, Honolulu, Hawaii, 96819.

NEW SOURCE OF PUBLICATION (no page charges!!!): The following information is taken from the Association of Systematics Collections Newsletter vol.11: "Theses Zoologicae is a series that includes papers along systematico-morphological outlines which are too lengthy for inclusion in regular journals and too limited in scope to be published as a single book. Texts will be reproduced directly from typescript by offset, and half-tone-plates (from photos) will be printed in the conventional manner. To facilitate preparing of the typescript, the publisher has manuscript sheets available which will be sent on request to interested zoologists free of costs. Please contact the publisher before preparing the manuscript: J. Cramer. In den Springaeckern 2. D-3300 Braunschweig. W.-Germany. Authors will receive 25 copies of their book free of cost, no page charge will be billed the author, and the number of pages and plates is not limited."

MYMARID MEMO: John Huber has three more names to add to the list of taxonomists working on Mymaridae [see FORUM No. 2, p. 5-6). They are:

Dr. A. Donev
Chair of Zoology
University of Plovdiv
"Paissii Hilendarski"
24, Tsar Assen Street,
Plovdiv 4000, Bulgaria

Dr. Donev is working on the genus Erythmelus.

Mr. R.S. George
Marris House
8 Saint Peter's Street
Duxford, Cambridge
England CB2 4RP

Mr. George is compiling a list of names, sources, etc., and a bibliography of the taxonomic literature on the Mymaridae.

Mr. K. Lakin
Department of Entomology
University of Arizona
Tucson, Arizona 85721
U.S.A.

Mr. Lakin is working on the genus Polynema in Arizona and biology of a species of Erythmelus.

"So far, only the names of people studying the taxonomy of the mymarids have been listed in the mymarid memo. I would appreciate it if those people working on mymarid biology were also brought to my attention so they can be included." [If you know of such people, write directly to John at the address given in our mailing list, Eds.]

SPECIMEN EXCHANGE: The following letter comes to us from Paul Dessart and should have been included in the last FORUM:

"It is a great honour for me to have been listed among the most celebrated Chalcidologists. As you probably know, my interest is centered on Ceraphronoidea. But as head of the Section Entomologie of my Institute and keeping in charge of all the Hymenoptera collections, I should be happy to stay in contact with your "club." In compensation, I have something to propose to all of you. Among the PROCTOS [newsletter] members, it is a custom to exchange the respective families collected with Malaise traps (or any methods): I should be happy to extend these exchanges and, as for me, I am ready to give most of our chalcids in exchange for Ceraphronoidea. The conditions are extremely advantageous: numbers are not considered, so much more chalcids given than ceraphronoids received; identified doublets are only (very) welcome but not obligatory; however, I wish to get for our library reprints or notes mentioning this material. (Practically, each member of PROCTOS sends the material he collected, after selecting his own group, and each colleague picks what interests himself and sends the vial to the next.)

Having revised the ceraphronid types of the species described by A. Förster (1861) in "Ein Tag in den Hochalpen," I went and collected this summer in the "Roseggthal" from which Förster described also many new (?) chalcids; does anyone wish to receive part of this material (as topotypes or to help solve some taxonomical problem)?"

FREE SPECIMENS: John LaSalle writes "I have recently reared a large series of Quadrastichodella eucalypti (Timberlake) from seed pods of Eucalyptus in Riverside, California. This is a phytophagous member of the Tetrastichinae (Eulophidae). This material has been critical point dried, and is in excellent condition. It is not only topotypical material, but it represents the type-species of the genus Flockiella Timberlake (since synonymized with Quadrastichodella Girault by Boucek, 1977). I will gladly send specimens to anyone who writes to me and tells me that they want some". [Many thanks to John for this submission; this is the kind of thing we hope to get more of, Eds.]

HELP!!!. In the same letter, John LaSalle also includes the following: "I am currently finishing a revision of the genus Leptofoenus (with G. Stage) and there are two types that are missing. These are Pelecinella phantasma Westwood (should be in Hope Museum, Oxford) and Leptofoenus australiensis Dodd (should be in Queensland Museum or CSIRO, Canberra). Neither of these specimens are where they belong. If anyone has any information concerning these types, I would appreciate hearing it".

SPECIMENS WANTED:

From Mike Rose: "I would very much appreciate receiving specimens of Eretmocerus. Dry specimens are much preferred. Host association is critical to biological control, thus reared material, along with the whitefly host, is most valuable. Additionally, Paul DeBach and I are continuing to work with Aleurodophilus, Aspidiotiphagus, and Encarsia. Therefore, I very much desire all parasites reared from whitefly and armored scales. Again, both the parasites and hosts should be sent dry, packaged between layers of cotton in clean glass vials. Jim Woolley and I are striving to build the reference collection of whitefly and armored scale parasites at Texas A & M. Representatives of the aforementioned solicited materials will be housed in the collections of the Department of Entomology, Texas A & M University."

From Peter Jensen: "Since I intend to revise the European genera of the subtribe Microteryina I am especially interested in studying European material of the genera Microterys, Aschitus, Trichomasthus, Hoplopsis, Subprionomitus, Nikolskiella. It is my hope that other chalcidologists will allow me to study their material of Microteryini. Please send material to Peter Bonde Jensen, c/o Dr. Ole Lomholdt, Zoologisk Museum, Universitetsparken 15, DK-2100 Copenhagen, Denmark."

IDENTIFICATIONS:

John Noyes (British Museum, London) writes "I would be very willing to attempt to identify encyrtids from any part of the world. Collections to generic level only unless they contain some easily recognised species. Smaller samples I will do my best to identify to species level especially if they are of agricultural importance, or being used in a project of some sort. I would expect to keep at least half of the material sent for identification, but this is negotiable. I would prefer to mount material myself. Material should be sent layered, or in gelatin capsules held in place by well teased cotton wool if dry. If in alcohol please make sure that the alcohol is clean and that air bubbles are kept to a minimum and also that any data labels are on the outside of the tube. Adequate data should be included with all material, never code numbers only. Above all, all material should be well packed in shock proof containers. If specimens belong to a series, some of the series should be retained by the sender to avoid me having to return material."

Sandrine Ulenberg (Plantenziektenkundige Dienst, Wageningen) writes: "I am willing to identify Old and New World fig wasp parasites (Torymidae and Pteromalidae). The samples should contain females and males preserved in alcohol, mentioning the identity of the fig host." [See also comments by Prof. Wiebes in CHALCID FORUM No. 2, "Suggestions" under Etcetera.]

COLLECTING TRIP

Death Valley National Monument, California, U.S.A.
Eric Grissell

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

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

When one looks at the vast expanse of Death Valley it is tempting to agree that the name is well deserved. From a distance it is difficult to tell if life exists in any form. The floor of the valley seems to be nothing but sand or salt flat as far as the eye can see, and the rim appears to be nothing but variations on a theme of rocks. The southeastern half of the valley actually is quite desolate, especially around the more scenic areas such as Zabriskie Point or Artists Drive, and this is exemplified by the names of some of the associated mountain ranges -- Funeral and Black Mountains, for example. Yet in most of the valley life abounds in every imaginable form.

In general, we contended with fairly poor weather conditions for the entire trip. We were caught in two severe dust/sand storms, almost every day was windy, and temperatures were cool. We left the valley a day early when the forecast called for 60 mph winds and flashflooding. The only result of this forecast was a little rain (on us) at Badwater and the complete clouding over of the valley. Actually, we learned that weather forcasting in desert regions is worse (if at all possible) than is the norm elsewhere.

Collecting seemed, at the time, to be relatively poor. There were few large wasps or bees, and insects did not seem to be flying in general. Water was fairly freely available in the form of creeks and springs, Tamarix, Salix, and Prosopis were blooming (excellent Hymenoptera plants), and yet few wasps were taking advantage of the situation. We attributed the seemingly poor collecting to the even poorer weather, and drank a lot of rum and coke to make up the difference.

All of my collecting was done by sweeping, using either my aerial or screen net, and then tossing everything in alcohol to sort back at the museum. In retrospect the collecting turned out to be fairly good for chalcids. By sweeping various desert shrubs and/or habitats, I was able to accumulate several thousand specimens for the U. S. National Museum. Most common and widespread were the pteromalids and eulophids (of course), but I think the former were more numerous and diverse. Whereas the eulophids seemed to be mostly various species of Tetrastichus, the pteromalids were represented by quite a few different genera. Numerically most abundant was a Pteromalus which appeared to be attacking tephritids in the heads of composites. Other genera included Psilocera, Zatropis, Colotrechnus, Halticoptera, Trimeromicrus, and Gastrancistrus (at least 3 species). Chalcidids were represented mostly by some fairly large Acanthochalcis and a series of males and females of Schwarzella (females have not yet been described). Although Death Valley would seem to be an area of potentially high endemism, the 6 or 8 species of torymids (4 genera) which I collected may be found widely distributed throughout the southwestern United States (and northern Mexico). (I don't know enough about the other groups to say the same about them.)

The best collecting site for Hymenoptera was on the floor of the valley at a place called Salt Well (below sea level about 30 miles south of the visitor center at Furnace Creek). Here, a combination of warm weather (the only day near 80 F. on the trip), still air, and blooming Prosopis provided just the right condition for a hymenopterous frenzy. Chalcid collecting was even better later on the same day but up the road at a place called Eagle Borax Works. This is an area of brackish water, tules, and salt grass (Distichlis). This latter plant provided a diverse series of encyrtids, perhaps 8 or 10 species in as many genera, and was the only place where this family might be called common.

RESEARCH REPORTS

We are still seeking out responses to our "General Information Form" so that each of us has some idea of what the other person is working upon. We have roughly a fifty percent return (which is probably quite good), but a one hundred percent return would be better. Also, it is important to remember that this section should be updated by you anytime you feel that changes are warranted. This should be a dynamic section which alters as frequently as you complete one project and start another. The following forms have been returned and are all new to the FORUM.

Richard R. Askew: Dick is interested in the Eulophidae and "other chalcidoid families" as well as ecology, behavior, and morphology. He writes that he has "studied the organization of chalcid communities based on various herbivore host groups, especially gall-makers and leaf-miners. Taxonomic studies have mostly been a side-product of ecological research but I would like to devote more time to taxonomy in the future. At present drowning in a deluge of data on the host species of chalcids and exploring the possibility of transferring data to a computer."

Zdeněk Bouček: Zdenek writes the following about his work: "I collected first small beetles (big ones did not abound) but soon after my entomological beginnings, in 1941, I turned my attention more and more to Hymenoptera. Gradually I was attracted to Chalcidoidea, then regarded as the most difficult group (see Schmiedeknecht, 1930, Hymenoptera Nord- und Mitteleuropas, p. 402). Trying to prove that it is possible to do something about them I published some 120 papers and now am wondering whether I made it actually easier, or rather more difficult for younger colleagues to tackle this wonderful group. After university and army service I worked for a plant protection institute, later for the Prague National Museum and since 1970 have been employed by the Commonwealth Institute of Entomology (c/o Brit. Mus. N.H.) in London. -- Currently I am trying to finish keys to genera of about 2/3 of Australian Chalcidoidea, to explain what the genera of A. A. Girault actually are. But I have also some other irons in the fire, some together with Dr. de V. Graham and other colleagues."

Margarita Ceballos-Vazquez: Margarita is interested primarily in the Aphelinidae and especially Aphytis and Aspidiotiphagus. Other families of interest are Encyrtidae, Eulophidae, Eupelmidae, and Pteromalidae. She studies systematics of chalcids used in biological control including variability, ecology, and biology and has an interest in integrated pest control.

Edward (Ted) Dahms: Ted lists his group of principal interest as Encyrtidae. His research includes "biology, ethology, and taxonomic revision of genus Melittobia (Eulophidae)," "a revision of Girault's Australian genera of Encyrtidae with Gordon Gordh," "and a checklist of the types of Australian Hymenoptera described by A. A. Girault; Parts I & II now out, III and IV to go." Ted also comments that "this has occupied most of my time for the last 14 years." [Ted writes this from the Home for Sufferers of Girault Syndrome, an unknown and incurable malady.]

H. A. Dawah: Groups of principal interest include Eulophidae, Eurytomidae, and Pteromalide. Current research concerns "the biology and taxonomy of phytophagous Tetramesa and its parasitoids associated with family Graminae particularly the genus Pediobius."

G. Delvare: "Je suis moi-même responsable du Service d'identification d'un Institut, le GERDAT, qui a pour vocation la recherche agronomique sous les Tropiques. A ce titre, nous recevons des demandes d'identification en provenance d'Afrique de l'Ouest mais aussi d'Amérique du Sud. J'ai commencé l'étude systématique des Chalcidiens il y a quelques années et mon intérêt s'est naturellement concentré sur la faune palarctique. A présent, par nécessité du service, je suis obligé d'identifier les spécimens en provenance des régions exotiques (régions afrotropicale et neotropicale). Actuellement, j'ai entrepris la révision des Eurytoma décrits par RISBEC d'Afrique de l'Ouest et de Madagascar et déposés au Muséum d'Histoire Naturelle de Paris."

Miktat Doganlar: Dr. Doganlar's special interests are the Eulophidae (except Tetrastichinae) and Pteromalidae. He writes: "I did some work on biologies of parasitic Hymenoptera associated with lepidopterous pests of broad-leaved trees in British Columbia, Canada. During my stay in Canada, some new species of Chrysocharis and Sympiesis (Eulophidae) and some others of Mesopolobus, Arthrolytus and Pteromalus (Pteromalidae) were desribed. In the past three years, a check-list of Turkish

Chalcidoidea was completed, which will be published this year. I have just finished a systematic work on the Nearctic and Palearctic species of Dibrachys, by studing their hypopygia three new species were described form both regions, which should be published later this year or in the beginning of next year. I am currently working on the European and Turkish species of Pachyneuron, I hope it will be completed this year."

Les Ehler: Although Les has no particular interest in the taxonomy of a specific group of chalcidoids, he is forced to study them a bit. His primary interest lies in biological control and structure of parasitoid guilds. "I operate a small quarantine laboratory for importation of predators and parasites of arthropod pests. Much of this work involves routine identification of parasitic Hymenoptera, especially Chalcidoidea. At present, I am investigating the parasites of obscure scale (in quarantine) and those of Rhopalomyia californica (Cecidomyiidae) in the natural habitat. My goal is to become self sufficient in identification of Chalcidoidea rather than to produce new taxonomic revisions, etc."

M. J. Gijswijt: Principal areas of interest are the Chalcidoidea (except Mymaridae and Trichogrammatidae) of West Palearctic especially behavior, host-parasite relationships, and "cooperation in comparing relationship in courtship behavior with taxonomy based on morphology."

Varendran Gupta: Varendran is an authority on Ichneumonoidea and is head of the Center for Parasitic Hymenoptera in Gainesville, Florida (U.S.). He is currently revising the Indo-Australian Ichneumonidae catalog and is trapping parasitic Hymenoptera for possible future monographs.

Peter B. Jensen: Principal area of interest is the tribe Microteryini (Encyrtidae) of the world. He is also interested in the plant/host/parasite relationships of the tribe and hopes that "my research ... will soon allow me to publish a key to the European genera of Encyrtidae." [See also request for specimens under Etcetera.]

Kazuaki Kamijo: Principal area of interest is the Eulophidae, Pteromalidae, and Torymidae. He is also interested in Tetracampidae, Eupelmidae, and Eurytomidae and the biological control of forest pests. Dr. Kamijo is currently revising the Japanese species of Pediobius and some other genera of Eulophidae.

Y. Murakami: "I am working in biological control of orchard pests, mainly use of parasitoids of scale insects. At present I am working on biological control of the Chestnut Gall Wasp by Torymus sinensis Kamijo introduced from China recently. Also I was studying for two months in Brasil for the biological control study on citrus pests two years ago. I wish to continue this work."

Andre Panis: Principal area of interest is all chalcidoidea, but particularly Aphelinidae, Encyrtidae, Encyrtidae, Eulophidae, and Pteromalidae. He has additional interest in biocontrol and "behavior of adults [oviposition and host preferences]. Adult flow assessment between fruit crops and mediterranean vegatation series, biocenosis, and community structure in this agro-ecosystem. Biological and integrated control of scales and mealybugs in olive-citrus-groves, and ornamental plant glasshouses."

Vladimir Polacek: Dr. Polacek admits to "no taxonomic interest at all." He is primarily interested in "behavior, history of research, bibliographical research and literature work."

Gerhard L. Prinsloo: Primarily interested in taxonomy of Chalcidoidea, but also Proctotrupoidea and Cynipoidea and biocontrol. He has worked mainly on the Afrotropical Encrytidae and Aphelinidae during the past 12 years. Just completed a host-parasitoid index of Afrotropical Encyrtidae [see Recent Literature] and a guide to parasites of citrus pests in South Africa.

B. R. Subba Rao: Principal area of interest is the Chalcidoidea: Aphelinidae, Elasmidae, Encyrtidae, Eurytomidae, Mymaridae, Pteromalidae, Signiphoridae, and Trichogrammatidae. His other interests include biocontrol, and the biology, bionomics, and taxonomy of chalcidoids and braconids.

Mike Rose: "Currently, I am working as Quarantine Officer for Texas A & M University with research responsibilities in classical biological control and systematics of certain Aphelinidae; particularly parasites of whitefly and armored scale. My main taxonomic interest is the genus Eretmocerus. I have, on loan, many of the available "types" of named species of Eretmocerus and am actively soliciting material. Professor DeBach and I are describing a number of new species of Eretmocerus and Encarsia reared from Aleurothrixus floccosus collected in the Americas. We are also describing several new species reared from Parabemisia myricae. Following these descriptions a key to the named species of Eretmocerus of the world is planned." [See also "Specimens Wanted" section under Etcetera. Eds.]

Andrey Sharkov: "I work ... under the scientific guidance of Dr. V. A. Trjapitzin. At present I am studying the encyrtid fauna of the Soviet Far East and preparing the key of genera and species of this region. I also take an interest in morphology of Encyrtidae and other Chalcidoidea."

Malgorzata Skrzypczynska: Dr. Skrzypczynska is interested in Torymidae (especially in seeds of forest trees), Cecidomyiidae, and plant-galls. "I am interested in insects damaging seeds and cones of coniferous and deciduous trees ... and their parasites. For the past years I have been working on the entomofauna of cones of larch, spruce and fir in Poland. Now, I am studying the ecological relationship between the species and individuals mentioned above and the forest habitat."

Vincent J. Tepedino: "I am currently working on the behavior and population ecology of Monodontomerus obscurus Westwood, Pteromalus venustus Walker, and Tetrastichus megachilidis Burks. The ultimate goal is to develop methods for controlling these protelean parasites of the alfalfa leafcutting bee, Megachile rotundata F. This is my first research experience with these very interesting creatures; previously, I have worked almost exclusively with bees."

Sandrine Ulenberg: "The last few years I worked on a revision of the Palaeotropic genus Apocrypta Coquerel (under supervision of Prof. Wiebes). Members of this genus parasitize the fig-wasp symbiosis. Apocrypta is restricted in its distribution to figs of the Ficus sections Sycocarpus, Sycomorus and Neomorphe harbouring pollinating agaonid wasps of the genus Ceratosolen Mayr. This limited host plant association indicates a highly specific relationship with the symbiosis and serves as a rationale behind the generic revision and the phylogenetic analysis of Apocrypta: knowledge of the intrageneric relationships of Apocrypta will serve as an argument towards resolution of the discrepancy between the taxonomic sub-grouping of Ficus ... sections and the grouping of their pollinators. I am at the moment in the process of publishing these results. After the completion of this work I plan to look at the relationships between other torymid and pteromalid genera of fig-wasp parasites of the Palaeo- as well as the Neotropics."

John Werren: "My current research interests are the behavioral ecology and genetics of parasitic wasps. I have been working on sex ratio adaptations, particularly concerning the effects of host quality and population structure on sex allocation. I am also studying extrachromosomal inheritance in Nasonia vitripennis and the behavioral ecology of other chalcid species."

OBITUARY

Keizo Yasumatsu (1908-1983)·

Many hymenopterists know already of the death of Dr. Yasumatsu on 25 January 1983. An appreciation and biography was recently published in ESAKIA (December 1983, vol. 20:1-7) by Yoshihiro Hirashima. Additionally an extensive bibliography of 657 papers is presented in a companion article by Chujo, Yano, and Hirashima in the same issue (pages 9-45). The following information was provided to Arnold Menke by Hirashima for inclusion in SPHECOS No.8. It is a shortened version of the ESAKIA article and is presented in edited form herein.

Dr. Keizo Yasumatsu was born in Tokyo on 29 February 1908. [His parents, however, attributed his birth to 1 March so as not to deprive him of "three out of every four birthdays."] He was educated in Fukuoka, and received his M.S. in agriculture at Kyushu University, Fukuoka, in 1933. By the time he had completed this degree he had already published 36 papers on biological, taxonomic and morphological aspects of various insects. He worked at Kyushu from 1933 until retirement in 1971, receiving his PhD in 1945 and becoming Professor of Entomology in 1958.

Professor Yasumatsu travelled to Micronesia in 1940 as a member of the Micronesia Expedition conducted by Professor Esaki. He also visited China in 1942 as a member of the Scientific Expedition to Shansi. By the end of World War II, Yasumatsu had become internationally renowned for the systematics of Hymenoptera, especially wasps, ants, and bees, but he was also familiar with fleas, stick insects, and others.

The year 1946 was a commemorative year for Professor Yasumatsu. In the early summer of this year he discovered an encyrtid wasp parasitic on the red wax scale (Ceroplastes rubens), long known as one of the most serious pests of citrus and other economic plants in Japan. Because of his work on this parasite (Anicetus beneficus) he received a prize from the Association of Japanese Agricultural Science Societies in 1953 and another prize from the Asahi Press in 1959.

Yasumatsu studied biological control in the United States from 1956 to 1957. After his return from this study his interests shifted more and more towards the field of biological control. He published 130 articles on this subject. He also wrote a book, Natural Enemies - An Approach to Pest Management, in 1970. In 1964 he founded the Institute of Biological Control at Kyushu University. This is still the sole university institution of this discipline in Japan.

After retirement from Kyushu in 1971, Yasumatsu devoted himself to integrated crop protection research in Tailand. He worked here a total of six years (1972-74 and 1976-80).

In addition to research, Yasumatsu was active in the affairs of educational and scientific organizations. He was the president of the Entomological Society of Japan for 8 years (1961-68) and a member of both standing committees of the International Congress of Entomology and the International Congress of Plant Protection. He also played a role in the establishment of IOBC/SEARS of which he was the first president.

Professor Yasumatsu received many awards and honors during his distinguished career. These include the Medal with Purple Ribbon (Government of Japan, 1971), Second Harry Scott Smith Memorial Award (University of California, 1971), Doctor Emeritus of Science (Kasetsart University, Thailand, 1976), Third Class Order of the Rising Sun (Government of Japan, 1978), Honorary Member of the Entomological Society of Japan (1980), and Honorary Member of the International Congress of Entomology (1980).

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

Yasumatsu was a prolific writer and a skillful biological artist. Almost all illustrations of insects that appeared in his papers and books were of his making.

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

RECENT LITERATURE

The following papers have been sent to us or appeared since the last issue of the FORUM. We have undoubtedly missed a number of papers and your help is solicited to improve upon our coverage.

Askew, R. R. 1984. Variation in Cirrospilus vittatus Walker (Hym., Eulophidae) and the description of a new species from Britain. Entomol. Month. Mag. 120:63-68.

De Santis, L. 1983. Las espécies Argentinas, Uruguayas y Brasileñas del género Emersonella Girault, 1916 (Hym., Eulophidae). An. Soc. Entomol. Brasil. 12:249-259 [in Spanish].

Hedqvist, K.-J. 1984. [Some results from work on a catalogue of Swedish Chalcidoidea]. Entomol. Tidskr. 105:9-14 [in Swedish].

Jensen, P. B. 1983. Notes on Encyrtidae described or recorded from Denmark. Entomol. Meddr. 50:7-10.

Kamijo, K. 1983. A new genus and species of Pteromalidae parasitic on Lipara spp. in Japan. Kontyû 51:25-28.

_____. 1983. Five new species of Pediobius (Hym., Eulophidae) from Japan. Kontyû 51:458-467.

_____. 1983. A revision of the genus Elatoides Nikol'skaya (Hym., Pteromalidae), with description of a new species. Kontyû 51:573-581.

_____. 1983. Pteromalidae from Korea, with description of four new species. Ann. His.-Nat. Mus. Nat. Hung. 75:295-311.

_____ and H. Takada. 1983. A new Euneura species hyperparasitic on Stomaphis aphids and a note on the genus Gygaxia Delucchi (Hym., Pteromalidae). Akitu (n. ser.) 55:1-8.

Myartseva, S. N. 1984. [Geographic distribution and formation of the fauna of encyrtids in the arid zone of Middle Asia]. Entomol.Obor. 63:57-67 [in Russian].

Naumann, I. D. and D. P. A. Sands. 1984. Two Australian Elasmus spp. (Hym., Elasmidae), parasitoids of Pectinophora gossypiella (Saunders): their taxonomy and biology. J. Aust. Entomol. Soc. 23:25-32.

Prinsloo, G. L. 1983. A new genus and species of Encyrtidae from Peru. Acta Zoo. Lilloana 31:101-105.

_____. 1983. The southern African species of Gyranusoidea Compere (Hym., Encyrtidae). J. Entomol. Soc. Sth. Afr. 46:103-113.

_____. 1983. A parasitoid-host index of Afrotropical Encyrtidae. Entomol. Mem. Dep. Agric. Repub. S. Afr. No. 60:i-iii, 1-35.

Schauff, M.E. 1984. The Holarctic Genera of Mymaridae. Mem. Entomol. Soc. Wash. 12:1-67. [Twenty-two genera are recognized and keyed from the Holarctic region. Also included is a phylogenetic analysis of generic relationships and notes on hosts, distribution, synonymy, diagnoses, and morphology.]

Sharkov, A. V. 1984. [A new species of the genus Charitopus (Hym., Encyrtidae) from the Primorsky district]. Zool. Zhurnal 63:460-461 [in Russian].

Sorokina, A. P. 1984. [New species of the genus Trichogramma Westw. from the USSR]. Ent. Obor. 63:152-165 [in Russian].

Storozheva, N. A. 1984. [A new species of the genus Cleolophus (Hym., Eulophidae) from the USSR]. Zool. Zhurnal 63:462-464 [in Russian].

Szczepański, H. 1983. [Chalcidoidea in the forests of the Bialowieża National Park]. Pol. Pismo Entomol. 53:147-178 [in Polish].

Trjapitzin, V. A. 1984. [A new species of parasitic Hymenoptera of the genus Aethognathus (Hym., Encyrtidae) from Equatorial Guinea]. Zool. Zhurnal 63:294-296 [in Russian].

Yoshimoto, C.M. 1984. The families and subfamilies of Canadian chalcidoid wasps. The Insects and Arachnids of Canada, part 12. 149 pp. [Sixteen families are recognized and a key is presented. Each family is then broken into subfamilies (except 3) which are keyed and additional information is given for the genera that occur in Canada, known hosts, and references.]

Viggiani, G. 1984. Bionomics of the Aphelinidae. Ann. Rev. Entomol. 24:257-276.

MAILING LIST

As mentioned previously, in this issue we are only listing additions and corrections to the list of workers in issue 2 of the FORUM.

The following are changes in address (please note these new addresses in your mailing list):

Dr. A. Habu
1-15-19
Minami-machi
Warabi-shi
Saitam Pref.
Japan

Dr. K.A. Sahad
Plant Protection Division
Agriculture Complex
Farmgate
Dhaka-15
Bangladesh

Dr. M. Skrzypczynska
Department of Forest Entomology
Agricultural Academy
31-425 Krakow
Al. 29 Listopada 46
Poland

The following minor changes should be made to the previous mailing list:

A. Panis: Delete I.N.R.A.-37 Bd. du Cap, 06 602 Antibes and change to Route de Biot, 06560 Valbonne.

V. Polacek: Change "Pionyria" to "Pionyriu" and "25001" to "CS-25001."

S. Ulenberg: Change "Uhlenberg" to "Ulenberg."

J. T. Wiebes: Change "Weibes" to "Wiebes."

M. R. Hamerski: Change "Hamersley" to "Hamerski".

The following new names should be added to the mailing list:

Dr. Leopoldo E. Caltagirone
Division of Biological Control
University of California
1050 San Pablo Avenue
Albany, California 94706
USA_

Dr. G. Delvare
Gerdat
Centre de Recherches de Montpellier
Laboratoire de Faunistique
Avenue du val de Montferraud
R.C. Montpellier 74 C 5
France_

Dr. Jim DiGiulio
Oregon State University
Corvallis, Oregon 97331
USA_

Dr. Atanas Donev
Chair of Zoology
University of Plovdiv
"P. Hilendarski"
4000-Plovdiv
Bulgarien_

Dr. Stanislaw Glogowski
Instytut Zoologii Pol. Akad. N.
ul. Wilcza
00-679 Warszawa
Poland_

Dr. Kenneth Hagen
Division of Biological Control
University of California
1050 San Pablo Avenue
Albany, California 94706
USA_

Dr. Y. Hirose
Division of Insect Natural Enemies
Institute of Biological Control
Faculty of Agriculture
Kyushu University
Fukuoka
Japan_

Mr. Kim Alan Hoelmer
Department of Entomology
University of California
Berkeley, California .94720
USA_

Dr. D.S. (Woody) Horning, Jr.
Curator of Invertebrates
The Macleay Museum
The University of Sydney
NSW 2006
Australia_

Dr. Norman Johnson
Department of Entomology
1735 Neil Ave.
Ohio State University
Columbus, Ohio 43210
USA_

Ing. Vladimir Kalina
Vyzkumny Ustav Lesnicky
Vysoka skola zemedelska
Kostelec n. Cern lesy
nr. Phaha
Czechoslovakia_

Mr. Ken. Lakin
Department of Entomology
University of Arizona
Tucson, Arizona 85721
USA_

Librarian
Royal Entomolgical Society of London
41 Queen's Gate
London SW7 5HV
England_

Dr. Lubomir Masner
Entomology Research Institute
Research Branch, Agriculture
Ottawa, Ontario KIA OC6
Canada_

Dr. Steven Orzack
Museum of Comparative Zoology
Harvard University
Cambridge, Massachusetts 02138
USA_

Dr. A.V. Sharkov
Zoological Institute
Academy of Sciences
Leningrad, 199164
USSR_

Dr. Lionel Stange
Florida Department of Agriculture
and Consumer Services
P.O. Box 1269
Gainesville, Florida 32602
USA_

Mr. Mohammad Yousuf
Department of Zoology
Aligarh Muslim University
Aligarh 202001 U.P.
India_

STOP THE PRESSES !!!!

Recently Karl Krombein (Smithsonian Institution) uncovered what is believed to be A. A. Girault's first privately printed paper. (Cover page reproduced on right.) Arnold Menke is reprinting the entire paper in SPHECOS NO. 8 (pages 8-12) and readers are referred to that source for further details. With uncharacteristic good fortune, chalcid workers of the world may rejoice, for this paper has nothing to do with chalcidoids.

Some Sham Sights at a Muddauber

By PETER POORFELLOW

July 6, 1916