

Phorid Newsletter

Brian V. Brown, editor
Drawing of *Stichillus planipes* Borgmeier by Jesse Cantley

Number 5

??date

Again, greetings from Los Angeles! It has been a busy summer, but it is time for me to report on my Ecuador trip.

Phorid collecting activities in Ecuador, 1996.

This year I focussed my efforts on the South American country of Ecuador. In 1987 I made my first visit to the tropics, consisting of a rather poorly-organized but still fascinating visit to this country. I was interested to see how it would appear nine years later.

Unlike 1987, we had a huge advantage this time. Through a grant from our museum, I was able to send Mr. Peter Hibbs to Ecuador in late January to scout out field sites, operate Malaise traps and arrange collecting permits. Peter stayed there until late July and greatly increased the number of specimens that we were able to collect.

In May, Jesse Cantley and I travelled to Ecuador to join Peter. Our plans were to visit four sites: two on the Pacific (west)

slope of the Andes, one montane site on the Amazonian (east) slope of the Andes and one lowland site in the Amazonian region.

Our first locality was the Maquipucuna Biological Reserve, 1300m elevation on the western slope. We stayed there for only four days and got relatively little: I reared *Apocephalus (Mesophora) mortifer* from a small cantharid, I got several *Myriophora* and *Gymnophora spiracularis* from an injured millipede, and I collected several different phorids from ants.

Our next site was to be the Bilsa Biological Station in a coastal range of mountains in Esmeraldas province. It was to be a four-hour drive from Maquipucuna, which we had plenty of time for since we had to meet our transportation (pack mules) at 10:00AM. The night before we were to leave, however, it rained heavily and in the morning the road was blocked by numerous landslides. We struggled out, waiting for people to dig out the rocks and mud blocking the road, and finally made it to the main road, still hopeful of reaching the pack mules on time. A flat tire that had to be fixed and a truck blocking the road while

farmers loaded it with cattle completely obliterated our optimism, and we resigned ourselves to show up late and have to turn around again. Amazingly, when we arrived at the meeting site at 2:00PM the mules had just arrived. We packed our gear on them, and started walking up the 18km road to the station. It soon became apparent, however, that the road was incredibly bad, with thick, sucking mud up to mid-calf on every step. The mules and their driver quickly left us far behind, and eventually it got dark out. We were stuck: the mules had our flashlights, water, money and everything else. Eventually, the moon came up (at about 11:00PM) and it was bright enough for us to see and continue. Walking up that road all night was the most intensely brutal experience to which I have ever been subjected. We were exhausted, wet and incredibly footsore from the grasping mud. By the time we arrived at the station it was 5:00AM, and the howler monkeys were already beginning their morning calls.

The next day we were barely able to walk. My feet were rubbed raw and I was completely exhausted. Everyone at the station was astounded at how bad the road was.

When we got around to collecting at Bilsa we got a few things. We crushed a large number of different ponerine ants and got one species of *Apocephalus* attracted to all of them. We found a large raid of *Labidus praedator* and collected quite a few associated phorids. Injuring millipedes was also an excellent collecting method, which yielded huge numbers of *Myriophora* and *Puliciphora*. One especially interesting observation was the behavior of a couple of female *Dohrniphora ecitophila* that were attracted to some crushed *Odontomachus* ants. This phorid has an extremely long

proboscis that they were using to drag the ants away. When more than one female was on the tray they seemed to fight over the carcass.

We left Bilsa after a week, this type by a brutal ride on the back of packmules. Returning to Quito, we recovered and decided that rather than trying for two more sites, one more would be enough. We made plans for our final destination, Yasuni National Park in the amazonian lowlands. We drove to Yasuni in a single day, which I found rather frightening because the road traversed nearly the entire country. In 1987 most of this area was completely inaccessible; now it is cut-over and largely destroyed. Still, the scenery was spectacular, and with relatively few problems we reached the research station that night.

Yasuni turned out to be one of the richest and most productive sites at which I have ever collected. We collected large numbers and a great diversity of phorids associated with ants, and made many new ant-phorid associations. In particular, we found two species of phorids parasitizing the large ant *Cephalotes atratus*: one was an *Apocephalus* that was attacking the head, and the other was a *Diocophora* that, amazingly enough, was parasitizing the legs of the ant.

Another interesting observation was at a nest of the leaf-cutter ant *Atta cephalotes*, where we saw two species of *Neodohrniphora* attacking the ants simultaneously. We carefully collected individual ants that they attacked and I hope to demonstrate that the two species were partitioning the host resource based on ant worker size.

I could have stayed at Yasuni for much longer, but two weeks were all we had. I am still sorting through all the

material we collected, but clearly Ecuador, and especially Yasuni, was a tremendously rewarding place to work.

What's new on the Web?

The phorid website is located at:
<http://www.lam.mus.ca.us/lacmnh/departments/research/entomology/phorids/phorspez.html>

Recently, I posted my list of all phorid species so far recorded from La Selva Biological Station in Costa Rica. I soon hope to post some color images to go with this list.

In issue #4, I said I would list the phorid holdings in the Los Angeles County Museum. I decided not to do this, as it is probably of minimal interest to most people. I have posted this information on the web page, however, if anyone would like to see it.

Address change

Please note the new address for Dr. Guangchun Liu, who will be in South Korea for one year.

Updating Disney's book on Phoridae

As we all know, Dr. Henry Disney produced a wonderful textbook on Phoridae in 1994, exhaustively surveying the literature on phorid life histories, providing a new key to phorid genera and a list of the necessary literature to identify phorids to species. I propose that we provide updates to this book in the Phorid Newsletter so that this information is better

disseminated throughout the phorid community.

I want to point out this is not intended to be a forum for criticizing Henry's work. Instead, I wish to point out new information, omissions and small errors in fact that are inevitable when such a large work is undertaken.

NATURAL HISTORY. For starters, I will point out that a couple of life history papers about *Phalacrotophora punctiapex* Borgmeier were not included. This species is a nest parasite of sphecid wasps of the genus *Trypoxylon*, according to the following references:

Coville, R.E. and C. Griswold. 1983. Nesting biology of *Trypoxylon xanthandrum* in Costa Rica with observations on its spider prey (Hymenoptera: Sphecidae; Araneae: Senoculidae). *Journal of the Kansas Entomological Society* 56:205-216.

Coville, R.E. and C. Griswold. 1984. Biology of *Trypoxylon (Trypargilum) superbum* (Hymenoptera: Sphecidae), a spider-hunting wasp with extended guarding of the brood by males. *Journal of the Kansas Entomological Society* 57:365-376.

KEYS TO GENERA. The keys must be used with caution for specimens from the Neotropical Region. Some species will not key out to their correct genus, especially some *Beckerina*, *Macrocerides*, *Apocephalus* and many *Metopina*-group males. This was an unavoidable problem, because so much of the Neotropical fauna is unknown, but others should be aware of it.

Also a new genus, *Vestigipoda*, has been described: Disney, R.H.L. (1996) A new genus of scuttle fly (Diptera; Phoridae) whose legless, wingless, females mimic ant larvae (Hymenoptera; Formicidae). *Sociobiology*, 27, 95-118. It is unlikely

to be confused with any other phorid genera in the key, however!

GUIDE TO THE LITERATURE. Since the book has been published, the following new keys have become available:

Neotropical *Apocephalus* (*Mesophora*)-

Brown, B.V. (1996) Preliminary analysis of a host shift: revision of the Neotropical species of *Apocephalus*, subgenus *Mesophora* (Diptera: Phoridae). *Contributions in Science*, **462**, 1-36.

Neodohrniphora- Disney, R.H.L. (1996) A key to *Neodohrniphora* (Diptera: Phoridae), parasites of leaf-cutter ants (Hymenoptera: Formicidae). *Journal of Natural History*, **30**, 1377-1389.

Plethysmochaeta- Disney, R.H.L. (1995) New synonyms and a key to species of *Plethysmochaeta* Schmitz (Diptera, Phoridae). *Bonner zoologische Beiträge*, **45**, 259-263.

Complementary collecting techniques

Many of us are interested in collecting techniques from the viewpoint of getting the largest diversity of species from a site in the shortest amount of time. To date, little information has been published on this subject.

When I was in Peru a few years ago, I had a certain amount of time (about 4 weeks) to survey the phorid fauna as thoroughly as possible. I concentrated on the species of *Apocephalus*, my study group then and now, and collected them using six different techniques: 1) Malaise traps (4, run over the entire period), 2) collecting over army ant raids (we found 26 raids from which we collected *Apocephalus*), 3) blacklight traps (operated on five nights), 4) observing baited ants, 5) crushing ants to attract phorids, 6) rearing parasitoids from

fireflies.

These six techniques collected 53 species of *Apocephalus*. The number of species collected by the various methods were as follows:

	Number of spp. collected	
	Total	Exclusive
Malaise	23	20
Raids	22	20
BL	4	2
Over baited	3	2
Crushed	3	1
Rearing	1	1

The overlap of the catch of *Apocephalus* species is as follows:

	M	R	B	O	C	R
Malaise	23	1	1	0	1	0
Raids		22	0	1	0	0
B.L.			4	0	1	0
Over baited				3	0	0
Crushed					3	0
Rearing						1

To me it was interesting that the two most productive collecting techniques, Malaise trapping and watching army ant raids, had virtually no overlap in catch, with only one species shared. Presumably over time the Malaise traps might get these army ant associates too, but over my short collecting period this did not happen. Overall it seems that searching for army ant raids after putting up Malaise traps is the most efficient use of time when collecting *Apocephalus* in tropical rain forests.

Does anyone have comparable data for other sites? I would be interested in hearing any comments.

Phoridologists' Directory

The following is a list of the names, addresses and interests of phorid workers on my mailing list. Any additions, corrections or updates would be greatly appreciated. Those wanting to discuss their projects and interests at even greater length are welcome to do so.

Jeffery K. Barnes, Biological Survey, Rm.3132, Cultural Education Center, Albany, NY, 12230, U.S.A. Telephone (518) 486-2004.

Forbes P. Benton, CEPLAC/CEPEC/SECEN, Caixa Postal 7, CEP 45600-000, Itabun, Bahia, Brazil. Telephone (073) 214 3250. FAX (073) 214 3204. Email maxmz@ax.apc.org.
Interests: Natural history, identification and faunistic surveys of Brazilian Phoridae. Elucidation of phorid life cycles. Behavioral interactions between parasitic species and their hosts.

Brian V. Brown, Entomology Section, Natural History Museum of Los Angeles County, 900 Exposition Boulevard, Los Angeles, CA, 90007, U.S.A. Telephone (213) 744-3363. FAX (213) 746-2999. E-mail brianb@mizar.usc.edu. *Interests*: Taxonomy, evolution, reconstructed phylogeny, biogeography and natural history of world Phoridae. Currently I have a long-term project to revise the New World, ant-decapitating genus *Apocephalus*; also I am beginning to prepare the phorid sections for the series *Flies of the Nearctic Region*. I am interested in collecting methods for phorids, and in biodiversity surveys, especially those conducted in the tropics.

Matthias Buck, Dept. Ecology and Morphology of Animals, University of Ulm, Albert-Einstein-Allee 11, 89069 Ulm, GERMANY. E-mail meyer_eb@dulruu51.bitnet. *Interests*: Ecology and biology of Phoridae (PHD Thesis, to be finished by April 1995); community structure; ecology and biology of small saprophagous (especially necrophagous) Diptera breeding in small-sized and buried vertebrate and invertebrate carrion. Other interests are anatomy of the reproductive organs, larval morphology, phylogeny and hymenopterous parasitoids of small, necrophagous Diptera. So far, I have only worked in the Palaearctic Region. Future aspirations include a postdoctoral fellowship, or curatorship of Diptera at some natural history museum.

R. Henry L. Disney, Dept. Zoology, University of Cambridge, Downing Street, Cambridge, CB2 3EJ, United Kingdom. Telephone 0223 336654. FAX 0223 336676. *Interests*: Biology, taxonomy, phylogenetic reconstruction of world Phoridae. Currently revising Termitoxeniinae, including *Alamira* and *Perissa*.

Ewa Durska, Polska Akademia Nauk, Muzeum i Instytut Zoologii, 00-679 Warszawa ul Wilcza 64, Poland. *Interests*: Phoridae of Poland

Donald H. Feener, Jr., Department of Biology, University of Utah, Salt Lake City, UT, 84112, U.S.A. Telephone (801) 581-6444. FAX (801) 581-4668. E-mail feener@bioscience.utah.edu. *Interests*: Ant-phorid interactions in general. Specific projects include: 1) chemical ecology of host location in phorid parasitoids of ants; 2) phorid parasitoids as biological control agents of pest ants; 3) evolution of host specificity of phorid parasitoids; 4) behavioral ecology of ant defenses against phorid parasitoids. I work mostly in the New World temperate and tropical regions, especially the southwestern U.S.A. and Central America (Costa Rica, Panama).

Mauro Gori, Via Del Cronaca 19, 50142 Firenze, Italy. Telephone 055/700588. *Interests*: Italian phorid fauna; life histories.

Tadao Gotô, Central Forest Research Lab and Training Center, Royal Forest Department, Bangken, Bangkok, 10900 Thailand.

David H. Kistner, California State University, Chico, CA, 95929-0515, U.S.A. Telephone (916) 898-5116. FAX (916) 898-6804. *Interests*: Mostly interested in Phoridae inhabiting the nests of social insects or preying on social insects. I am interested in all biogeographic regions, but have minimal taxonomic interests. I am currently working in collaboration with Henry Disney on Termitoxeniinae and a study of Phoridae of the upper Sacramento River, based on cantara spill collections.

Victor A. Kolyada, Department of Entomology, Zoological Museum of the Moscow State University, 6 Herzen Str. Moscow 103009, Russia. *Interests*: Taxonomy of the genus *Megaselia* and its fauna in the Palaearctic Region. Interested in exchanging for determined specimens from other biogeographical regions. Also interested in collecting methods.

Guangchun Liu, Ecological Laboratory, Department of Biology, College of Natural Science, Pusan National University, Pusan 609-735, South Korea. Telephone (024) 282-5074. *Interests*: Taxonomy of phorids; Chinese phorid fauna; phorids associated with mushrooms in China.

Marina Michailovskaya, Laboratory of Insects, Gornotaezhnaya Station, AN RAN, Ussurijsk District, Primorye Territory, 692533, Russia. *Interests*: Taxonomy of phorids; Far East phorid fauna, including Primorskiy kraiy, Chabarovskiyy kraiy, Sachalin, Kamchatka; phorids associated with dead animals.

Lloyd Morrison, Zoology Department, University of Texas, Austin, TX, 78712, U.S.A. Telephone (512) 471-2825. FAX same as telephone. E-mail lmorrison@mail.utexas.edu. *Interests*: Effects of phorid parasitoids (genus *Pseudacteon*) on ant foraging and interspecific competition (genus *Solenopsis*); ant host species-specificity of *Pseudacteon* phorids; introduction of South American *Pseudacteon* species to the U.S. (Texas) as biological control agents against the imported fire ant, *S. invicta*.

Mikhail B. Mostovski, Arthropod Laboratory, Palaeontological Institute, 123, Profsoyuznaya Str., Moscow, 117647, Russia. Telephone (095) 467-2340. FAX (095) 339-0622. E-mail rasna@glas.apc.org. *Interests*: Phorid fauna of former USSR.

E. Hugh A. Oliver, 172 Upper Dinsdale Road, Hamilton, New Zealand. Telephone 84 79541. FAX 64 7 838 5085. *Interests*: New Zealand phorid taxonomy and natural history.

Matt Orr, Division of Zoology, University of Texas, Austin, TX, 78712, U.S.A. Telephone (512) 471-2825. FAX same as telephone. E-mail morr@emx.cc.utexas.edu. *Interests*: Influences of phorids on ant foraging ecology, especially pest ants. Ant taxa of interest include *Atta*, *Solenopsis*, and *Linepithema*.

Sanford D. Porter, USDA-ARS, MAVERL, 1600 SW 23rd Drive, P.O. Box 14565, Gainesville, FL, 32604, U.S.A. Telephone (904) 374-5914. FAX (904) 374-5818. E-mail

sdp@gnv.ifas.ufl.edu. *Interests*: Ant-parasitizing phorids, especially *Pseudacteon*: oviposition behavior, growth and development of larvae and pupae, host specificity, responses of ant hosts, biocontrol.

Sabine Prescher, Hinter der Masch 26, 38114 Braunschweig, Germany. Telephone 05 31 - 57

90 92. *Interests*: Palaearctic Phoridae, especially ecology of various species. Current projects include determination of specimens and evaluation of the results of Phoridae collected in: 1) the nature preserve area "Apfelstedter Ried" in Thuringia (Germany) with moist meadows; 2) moist meadows, dry meadows, wheat fields and maize fields at the village Limpach near Zürich, Switzerland; 3) caverns in Rhineland-Pfalz, Germany; and 4) a gravel pit near the city of Köln, Germany (now finished; a paper is expected at the end of the year).

Athayde Tonhasca, Universidade Estadual do Norte Fluminense, Centro de Ciências e Tecnologias Agropecuarias, Avenida Alberto Lamego, 2000, Campos dos Goytacazes, RJ, Brazil. *Interests*: Phorids attacking leaf-cutting ants.

Holger Triltsch, Federal Biological Research Center for Agriculture and Forestry, Institute for Integrated Plant Protection, Stahnsdorfer Damm 81, D-14532, Kleinmachnow, Germany. Telephone 033 203/22423-5, /48 300. FAX 033 203/22278. *Interests*: Species of *Phalacrotophora* Enderlein as parasites of Coccinellidae, especially *Coccinella septempunctata* L.; factors which determine the degree of parasitization; distribution in cereal fields and farmland.

Sven-Olof Ulefors, Ringvägen 14, 4tr, 737 41 Fagersta, Sweden. Telephone 46-223-19541.

Interests: Canadian species of *Megaselia*; separation of *M. pulicaria*-group species.

Axel Froese and Bill Robinson have both informed me that they no longer work on phorids.

Next issue!

My annual review of phorid literature will appear in the next issue. If anyone would like to contribute an article, or any other information of phoridological interest, please let me know.