The Tachinid Times

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Welcome to the first issue of **The Tachinid Times** for the new Century and new Millennium. To those of you who contributed to this issue of the newsletter and those who pledged moral support, I extent my sincere thanks. Continued support - in the form of periodic submissions - will ensure that this newsletter continues.

This newsletter is not intended to take the place of regular peer-reviewed articles on the Tachinidae. However, with the advent of the WWW and the appearance of this newsletter in that medium, it is now possible for **The Tachinid Times** to publish colour pictures (i.e. digital images) in association with written submissions. As an example, some of you may wish to submit summaries of work published elsewhere and include colour images which would be of interest to the readership but were not publishable in the hardcopy journal. In particular, colour pictures of tachinids parasitizing hosts would be welcome. As another example, pictures can accompany field trip articles, as they do my account of a field trip in this issue. If only a few images are required then I can have the slides, negatives or prints scanned here, otherwise I ask that they be sent to me in digital form. The hardcopy edition of this newsletter will continue for the present but will normally not include pictures.

I do not normally refer to tachinid literature here, but two very significant publications appeared recently which warrant special mention: a treatment of the genera of Palearctic Tachinidae by H.-P. Tschorsnig and V. Richter in the series *Manual of Palaearctic Diptera* and a treatment of Chinese Tachinidae to the species level by C.-m. Chao in a two volume work entitled *Flies of China* (see citations in literature section). Tachinids are notoriously difficult to identify so works such as these are extremely useful.

As usual, please send me your news for inclusion in the newsletter before the end of next January. The newsletter appears first in hardcopy and then on the WWW some weeks later (http://res.agr.ca/brd/tachinid/times/index.html).

***Microsoma exiguum* (Meigen), a candidate biological control agent for the curculionid *Sitona lepidus* (by L. Reimer and U. Kuhlmann)**

The clover root weevil, *Sitona lepidus* Gyllenhal (Coleoptera: Curculionidae) has become a pest of white clover (*Trifolium repens* L.) in the central North Island of New Zealand since its discovery in 1996 and appears likely to spread throughout the country. *Sitona lepidus* was probably accidentally introduced from its native Europe, or from North America where it has also colonised. As *S. lepidus* damages foliage, roots and root nodules, it causes financial loss in natural nitrogen fertilisation, pasture and to the honey industry.

Recent successful biological control of sitona weevil, *Sitona discoideus* Gyllenhal, and Argentine stem weevil, *Listronotus bonariensis* Kuschel, using *Microctonus* spp. parasitoids has led New Zealand's scientists to consider biological control as a component of a future integrated management system. An investigation into the natural enemies of *S. lepidus* is, therefore, to be conducted at CABI Bioscience Centre, Switzerland, as part of a joint research programme with AgResearch, New Zealand (Drs. Stephen Goldson and Craig Phillips).

The primary objective is to discover candidate agents for the biological control of *S. lepidus* in New Zealand. *Sitona* species were collected during bi- or tri-monthly samplings between May and September at the three

different collection sites in Switzerland. In general, *S. lepidus* and *S. sulcifrons* Thunberg were found to be the dominant species in all locations studied. At the collection site Laupersdorf (Balsthal Valley), *S. sulcifrons* was more abundant probably due to the higher proportion of red clover grown. In contrast, *S. lepidus* was abundant in Vicques and Delémont (both Delémont Valley) where white clover was the dominant host plant. The following *Sitona* species were found in small numbers at all collection sites: *S. hispidulus* (Fabricius), *S. lineatus* L., *S. puncticollis* Stephens, and *S. humeralis* Stephens.

In total, 42 collections were made during the course of the 1999 season and 9,093 *S. lepidus* were collected and identified. A fraction of 2,189 *S. lepidus* were reared to await parasitoid emergence. A total of 73 *Microctonus aethiopoides* Loan (Hymenoptera: Braconidae) and 55 *Microsoma exiguum* (Meigen) (Tachinidae) were obtained at the three collection sites, resulting in an overall parasitism rate of 5.8% for Switzerland in 1999. The rate of parasitism by the tachinid *M. exiguum* based on adult emergence ranged between 1.1% to 5.8% at Laupersdorf, 0.9% to 12.9% at Vicques, and 2% to 18.2% at Delémont.

According to dissections of *S. lepidus* adults over the course of the season, *M. exiguum* adults appear to have two or eventually three emergence periods per year. Tachinid adults emerged from overwintering *S. lepidus* weevils in late spring and parasitize remaining individuals of the same overwintering generation of *S. lepidus* in the end of May or beginning of June. As a result, a first instar larva was found on 21 May, seven first instar and nine second instar larvae were found on 1 June, three first instar, two second instar and three third instar larvae were found on 9 June 1999. From mid June until mid September only a few first and second instar larvae of *M. exiguum* were found but the number of early instars of *M. exiguum* increased between mid of September to the end of October.

Pupal development of *M. exiguum* lasted on an average 11 days ± 2SE (range 7-17 days) at 24°C in the laboratory. Tachinids emerged were used to elicit mating in captivity but mating attempts were not successful. Adults lived about 23 to 29 days (mean 26 days ± 3SE, range 1-50 days) at 24°C in the laboratory. The oviposition of *M. exiguum* was studied briefly using females that were collected in a Malaise trap at Delémont at the end of June or beginning of July. Individual females were kept together with 2 or 3 *S. lepidus* individuals in a small Petri-dish to observe oviposition behaviour. Females attacked hosts after 6.5 to 12.5 minutes and a single egg was placed mostly between head and thorax. Duration of attack lasted less than a second. Weevils died after 5.5 to 7 hours and afterwards weevils were dissected to locate first instar larvae of *M. exiguum*. First instar larvae were found in the dorsal pronotum and a second instar was found in the metathorax after one week.

Biological control of the Mexican rice borer, *Eoreuma loftini* (Dyar), by *Lydella jalisco* Woodley (by B.C. Legaspi, Jr., J.C. Legaspi, I. Lauziere and W.A. Jones)

[First 3 authors affiliated with Texas Agricultural Experiment Station, Weslaco, Texas; Jones affiliated with USDA ARS Beneficial Insects Research Unit, Weslaco, Texas.]

In the Lower Rio Grande Valley of Texas, the key pest of sugarcane is the Mexican rice borer, *Eoreuma loftini* (Dyar) (Lepidoptera: Pyralidae), which causes an estimated $10-20 million loss (about one-third of gross revenues). Farmers do not treat their fields chemically, believing that the protected habitat of the insect inside the stalk makes insecticides ineffective and uneconomical. To mitigate pest losses due to the rice borer, the USDA and Texas A&M centers in Weslaco initiated a 3-year joint project in April 1998 to evaluate the efficacy of the Jalisco fly, *Lydella jalisco* Woodley (Diptera: Tachinidae) as a biological control agent. Parasitism rates of about 30% are common in its native Mexico, where the fly exhibits apparent geographical and biological specificity to the host. The biology of the fly was studied in the laboratory to design efficient mass rearing methods. Temperature-dependent development of the parasitoid was fitted to Logan curves. Studies on the reproductive biology of the fly showed lifetime potential fecundity of about 400, with egg load positively correlated to adult parasitoid size. Weight of emergent fly larvae was also correlated to host weight at parasitization. Parasitoid larval development time declined asymptotically with host weight. To test whether the flies attack the borer on host plants other than sugarcane, borer larvae were infested onto potted corn, rice, sorghum and johnsongrass (a weed alternate host in Mexico) in a greenhouse. Adult female flies attacked borers on all plant hosts, including johnsongrass to a lesser extent. Should the borer become a pest in USA on crops other than sugarcane, this knowledge will be useful. Field tests are currently underway to assess biological control potential on sugarcane, corn, sorghum, and rice.

Update of tachinid names in Arnaud's (1978) Host-Parasite Catalog of North American Tachinidae (by J.E. O'Hara)

North American researchers working with the

Tachinidae have long found Arnaud's (1978) host-parasite catalog invaluable for the list of hosts and associated references provided therein. However, the catalog is based on literature published up to 1969 and is now getting out of date both with respect to new host records published since 1969 and the tachinid names used in the catalog. The tachinid bibliography provided at http://res.agr.ca/ecorc/isbi/biocont/biblio.htm and online literature databases like BIOSIS and Review of Agricultural Entomology help a bit with the search for host records published over the past 30 years but most researchers have not had a resource available for finding the current name of a tachinid listed in the 1978 host-parasite catalog. To address this problem I have prepared a web page comparing Arnaud's tachinid names with current names, using as a basis for the latter the Checklist of Tachinidae of America North of Mexico by myself and D.M. Wood (http://res.agr.ca/ecorc/isbi/cat/cathom.htm). The web page with Arnaud's names and current names is online at http://res.agr.ca/ecorc/isbi/cat/arnaud.htm.

Reference

Arnaud, P.H. 1978. A host-parasite catalog of North American Tachinidae (Diptera). United States Department of Agriculture, Miscellaneous Publication **1319**, 860 pages.

Control of *Spodoptera* spp. (Noctuidae) by a tachinid on sunflower in Bolivia (by C.J.H. Pruett)

Introduction

Sunflower, *Helianthus annuus* L. (Asteridae, Compositae [=Asteraceae]), since its introduction in 1988 (80 hectares) as a commercial crop in Santa Cruz, Bolivia, has had very few pest problems. However in late sown winter crops of sunflower the army worms, *Spodoptera sunia* (Guenée) and *Spodoptera eridiana* (Cramer) (Lepidoptera, Noctuidae, Amphipyrinae), have been responsible for very serious losses, up to 100% defoliation and destruction of the developing seeds.

Present situation

In 1998 an estimated 90,000 hectares of sunflower were sown in the winter season in the Santa Cruz department; an exceptionally high incidence of *Spodoptera* attack was recorded with many farmers reporting a total loss.

This situation occurs whenever late sown winter sunflower is not adequately scouted, the *Spodoptera* focuses of attack are not noted and the crop cannot be sprayed in time; spraying early enough to effect insecticidal control is difficult because *Spodoptera* larvae commence larval development on the common broad leafed weed "chiori" first, *Amaranthus* spp., *quitensis* HBK, *espinosus* L. and *viridis* L. (Caryophyllidae, Amaranthaceae) and then change to sunflower, where they are barely visible until the last instar because they occur in aggregated areas and not uniformly through the crop; they are also well hidden under the lower leaves of the sunflower plant which may reach a height of two metres. *Amaranthus* spp. are common weeds in sunflower crops, as is also the railway daisy, *Bidens pilosa*, and other species and these are difficult to control in sunflower crops.

Tachinid control of Spodoptera *spp.*

We have some interesting news concerning *Spodoptera* control by a tachinid on the sunflower crop in Bolivia. We have observed during the last three years (1997, 1998 and 1999) that after tremendous attacks by *Spodoptera sunia* and *Spodoptera eridiana* and complete defoliation of sunflowers fields, almost 99.5% control was recorded by an unidentified tachinid species (more than 5,000 *Spodoptera* larvae were collected and reared in the laboratory). Unfortunately, control was not achieved until after the crop was totally destroyed.

Also present in the defoliated crops were numbers of ichneumonid wasp parasitoids, ?*Trachysphyrus* sp., and large numbers of ground predators, particularly *Calosoma* sp. (Coleoptera, Carabidae) and *Apiomerus* sp. (Hemiptera, Heteroptera, Reduviidae) which devoured, even in full daylight, healthy and parasitized *Spodoptera* larvae.

Economic importance of Spodoptera *spp. in Santa Cruz*

In the last five years a very serious problem has presented itself in the agricultural sector of the Santa Cruz department due to the devastating attacks by the *Spodoptera* species complex in the annual cash crops such as cotton, rice, maize (corn) wheat, sunflower, sorghum and soya, whose damages ascend to more than US$10 million in insecticide use alone.

It could also be calculated that in maize and sunflower the cost of insecticide use against *Spodoptera* in 1998/99 was more than US$5,370,000 for one application or more in 89,000 hectares of maize and 90,0000 hectares of sunflower.

Some corrections to Sabrosky's *Family-group names in Diptera* (by J.E. O'Hara)

Curtis Sabrosky's long-awaited *Family-group names in Diptera* was published by Backhuys in *Myia* in 1999. Sadly, Curt did not live to see his magnum opus published, but through the efforts of his colleagues Chris Thompson and Neal Evenhuis the nearly-completed manuscript was

finished and brought to press.

Family-group names in Diptera is the sort of reference work that is needed for every group of organisms but is available for few. I will not attempt to review this work here so I will not discuss its content and many merits, but suffice it to say that this is a work I expect to consult for as long as I continue to work on Diptera.

During preparation of the upcoming *Catalogue of Diptera of America North of Mexico* by myself and Monty Wood, I compared all of our generic entries with those in *Family-group names in Diptera*. This resulted in a few changes to our *Catalogue* but also uncovered some slight minor errors in *Family-group names in Diptera*.

Please note the following changes:

Page 105, **Cyzenis** Robineau-Desvoidy, "Herting (1884: 69," should read "Herting (1984: 69,".

Page 131, **Euexorista** Townsend, "*Euexorista futilis* (Osten Sacken)" should read *Euexorista rebaptizata* Gosseries".

Page 271, **Rondania** Robineau-Desvoidy, "*R. cucullata* Robineau-Desvoidy 1830" should read "*R. cucullata* Robineau-Desvoidy 1850".

Page 325, **Zelia** Robineau-Desvoidy, "Type, *Z. rostrata* Robineau-Desvoidy 1830 (des. Coquillett 1910b: 621)" should read "Type, *Z. rostrata* Robineau-Desvoidy 1830 (des. Coquillett 1910b: 621) = *Zelia vertebrata* (Say)".

Please note also these changes to the *Bibliography*:

Brauer, F. & Bergenstamm, Julius Edler von, 1889, add in small print after reference: "Also published, 1890, F. Tempsky, Wien. 112 pp."

Brauer, F. & Bergenstamm, J. E. von, 1895, "Also published, 1895, *Denkschr. Akad. Wiss. Wien* (1894) 60: 89-240" should read "Also published, 1895, *Denkschr. Akad. Wiss. Wien* (1894) 61: 537-624".

References

Sabrosky, C.W. 1999. Family-group names in Diptera. An annotated catalog. Myia **10**: 1-360.

Thompson, F.C., Evenhuis, N.L. and Sabrosky, C.W. 1999. Bibliography. Myia **10**: 361-574.

Correction to a publication on the ecology of two *Myiopharus* species (by R. López)

Please note corrections to the paper:

López, E.R., Roth, L.C., Ferro, D.N., Hosmer, D. and Mafra-Neto, A. 1997. Behavioral ecology of *Myiopharus doryphorae* and *Myiopharus aberrans*, tachinid parasitoids of the Colorado potato beetle. J. Insect Behavior **10**: 49-78.

There were some mistakes on the numbering of the tables by the editors that I missed in the revision stage. It is just the numbers but it is enough to cause confusion to the readers.

Corrections are as follow:

Page 64, Table III is actually Table V.

Page 66, Table IV is actually Table III.

Page 71, Table V is actually Table IV.

I hope this will solve the headaches for those who had tried to make sense of the paper.

An account of a collecting trip to the mountains of southern Arizona and New Mexico, USA (by J.E. O'Hara)

[A slide show and list of species collected accompanies the online version of this account.]

When the rains started early in the American Southwest in the summer of 1999, I took this as a good omen for my collecting trip in August, since a wet year is generally a good year for tachinid collecting. I was a little apprehensive on this trip because it was about my tenth to Arizona and New Mexico in 20 years and I wondered if my catch would be so significant as to justify the time and expense. A successful trip would be measured against three primary goals I had set while planning it: 1) to collect undescribed and rarely-collected tachinids belonging to the *Lypha* group (comprising about 15 genera) for a revision I am working on, 2) to find new tachinid records for America north of Mexico for a catalogue of the region in preparation with Monty Wood, and 3) to increase our limited knowledge of the Tachinidae of Arizona and New Mexico.

For the sake of completeness, and particularly for readers who may be familiar with some of the localities I visited on this trip, I record here briefly my collecting itinerary between 2-23 August 1999: hilltop near Cedarvale, NM; Manzano Mtns., NM; Cherry Creek campground, Gila National Forest, NM; hilltop of "A" Mtn., Tucson, AZ; Lower Ash Creek, Galiuro Mtns., AZ; various canyons and hilltops in Huachuca Mtns., AZ; Ash Canyon, Rincon Mtns., AZ; Indian Creek Canyon, Animas Mtns., NM; Cherry Creek campground and nearby meadow and hilltop, Gila National Forest, NM; various canyons in Manzano Mtns., NM.

Rather than present a travelogue of my trip, I will focus on three of the more noteworthy mountain ranges I visited. The first of these is the Huachuca Mountains, a range situated just north of the Mexican border and less than 100 miles by road southeast of Tucson, AZ. The northern portion of the Huachucas is occupied by the military base Fort Huachuca, a small portion in the south (overlooking Mexico) comprises the Coronado National

Memorial, the Nature Conservancy owns the lower reaches of east-facing Ramsey Canyon, and much of the rest is National Forest. An extensive network of trails connects most of the major canyons, hilltops and ridges from one end of the Huachucas to the other. The mountain range offers spectacular scenery, diverse wildlife, and rare birds seen in few other places north of Mexico; it also has one of the richest insect faunas in America north of Mexico, attracting entomologists from near and far. It is small wonder that insects from the larger eastern canyons of the Huachucas - Garden, Ramsey, Carr, Miller and Ash - are to be found in many insect collections.

Ramsey Canyon is the jewel of the Huachucas. Its lower portion is owned by the Nature Conservancy and permission is required to collect on Conservancy land or to cross over it to reach upper Ramsey Canyon. I have visited Ramsey Canyon a few times and found the best collecting to be on National Forest land beyond the Nature Conservancy holdings, along the so-called Hamburg trail. It is unfortunate that this area is not also protected, as it is ecologically fragile and can be accessed without permit by following trails from other canyons. It is home, for example, to the endangered and federally protected ridge-nosed rattlesnake.

The Canadian National Collection has good holdings of Tachinidae from Ramsey Canyon due mainly to the acquisition of material from R.F. Sternitzky, who collected in the canyon for a period of several years in the 1960s. I was therefore somewhat surprised in 1994 when I found that some of the 30 species I caught in one day on the Hamburg trail had never been taken in the canyon before, including several that were quite rare in collections and at least one of which was undescribed (see *The Tachinid Times* **8**, 1995, for an overview of my 1994 trip to the Southwest).

The easiest way to reach the Hamburg trail portion of Ramsey Canyon is to hike through Nature Conservancy land - including a long winding uphill trail at the top of which Conservancy land ends and National Forest land begins - and descend back into the canyon and continue on for a half mile or so. An area is reached, at 6000-6500', where big-tooth maple is common, a tiny meadow thick with wildflowers is nearby with a permanent stream alongside, and a boulder-filled dry stream bed is not far off. Certain tachinids will fly from boulder to boulder in the dry stream bed (e.g. *Hystricia testaceiventris* Wulp and other over-sized and bristly tachinids), others will frequent the wildflowers in the meadow or fly through the grass (e.g. jet black *Penthosia satanica* (Bigot)), a few will sit head-downward on the trunks of prominent trees (e.g. *Zelia wildermuthii* Walton, *Trixodes obesus* Coquillett) or on the ground beneath them (e.g. *Leskia* n.sp.), while individuals of a great many species will alight on the sun-drenched leaves of big-tooth maple. Attractiveness of the latter can sometimes be enhanced by spraying the leaves with a mixture of honey, cola, and water.

I was particularly anxious to collect along the Hamburg trail in Ramsey Canyon because I knew it contained several rarely-collected *Lypha*-group species of which additional specimens would be useful to my revision of the group. I hoped as well to find some other rarely-collected tachinids, but I did not expect to find any truly significant new records. I was wrong, as I did find several species of note in Ramsey Canyon: *Chrysotachina* n.sp. (a *Lypha*-group genus; no other specimens known of this species), *Leskia* n.sp. (some specimens from Durango, Mexico in CNC), *Meleterus montanus* Aldrich (new record for Arizona), *Myiopharus moestus* (Wulp) (new record for America north of Mexico) and *Myiopharus trifurca* (Wulp) (new record for Arizona). Many of the species I collected in 1994 were not seen in 1999, perhaps in part because I collected later in the season (September 22-24) on the earlier trip. Similarly, a day or two of collecting in such a highly diverse habitat is not enough time to thoroughly sample it. I also suspect that fluctuations in tachinid populations over time partly explain why repeated trips to a locality like Ramsey Canyon result in the capture of a significant number of different species from one year to the next.

Idyllic as Ramsey Canyon sounds, it can also be frustrating for a tachinid collector. The summer rains of late July to early September herald high tachinid activity in Ramsey Canyon but not necessarily good collecting. One can rise early in the morning and enter Ramsey Canyon under a sunny sky only to see clouds begin drifting over by 9:00 a.m. and cover the sky by late morning, with rain following shortly thereafter. This pattern can be repeated day after day. Tachinids are sun lovers and it is not unusual to see them disappear from leaves when a cloud obscures the sun and return when the sun reappears.

I visited Garden Canyon and Ida Canyon in the Huachucas for the first time on this trip. Garden Canyon has a good road up to about 6000' and permit-free collecting, but it resides on Fort Huachuca and therefore overnight camping is not permitted. I have seen records of interesting tachinids from Garden Canyon but did not have good collecting there during a one-day visit. Ida Canyon is on the southwest side of the Huachucas and was challenging to ascend in my government-issue Ford

Windstar. I was guided into Ida Canyon by John Stireman, a graduate student working on tachinid ecology at the University of Arizona in Tucson. John showed me a water seep where tachinids congregate in numbers at certain times of the year. It was not quite so active on this trip but some interesting tachinids were taken at the seep and elsewhere in Ida Canyon, including some of the more notable species taken in Ramsey Canyon. In addition, an undescribed *Ceromya* species was taken at blacklight.

The next mountain range I would like to discuss is the Animas Mountains. Straddling the continental divide, it rises out of the desert of southwestern New Mexico to a respectable height of 8500'. This range, like the Huachucas and Chiricahuas, is an extension into the United States of the Sierra Madre Occidental of Mexico and consequently can be expected to contain an interesting, though mostly undocumented, insect fauna.

The Animas Mountains have existed in relative entomological obscurity mainly because they lie on private land. Most mountain ranges in the Southwest contain some National Forest, which generally translates into public access roads and no-permit collecting, but the Animas Mountains are different. Up until 1990, 90% of the Animas Mountains were owned by the huge and locally famous Gray Ranch. In 1990 the Gray Ranch, comprising 321,000 acres, was sold to the Nature Conservancy in the biggest land purchase in the history of the Conservancy. In 1993, the land was sold to the Animas Foundation with the understanding that the Foundation would manage the Ranch under a mandate of protecting environmentally sensitive areas while also maintaining its role as valuable cattle range. The project is an ambitious one, as it attempts to strike a balance between the concerns of conservationalists and local land owners. There is no debating, however, the richness of the fauna and flora of the Animas Mountains, which are estimated to include over 700 species of plants, 75 species and subspecies of mammals, and more than 50 species of reptiles and amphibians. Very little is known about the insects of the Animas Mountains.

My particular interest in the Animas Mountains stems from the tachinid diversity I have seen in the Gila National Forest north of Silver City, not more than 75 miles due north of the Animas Mountains. One would expect, with the Animas Mountains so close to the Sierra Madre Occidental and on a direct north-south line with Silver City, that there must be some resident tachinids of note. Though not an especially big range, it does have high forest (including aspen and Douglas-fir), some permanent water, and is home to rare and endangered vertebrates.

I contacted the Program Director of Animas Foundation, Dr. Ben Brown, prior to my trip and obtained permission to collect in the Animas Mountains. Upon arrival in August, I was given directions to Indian Creek Canyon along with the combination for a locked gate along the way, as all access roads leading into the Animas Mountains are gated and locked. The track into Indian Creek Canyon is not intended for passenger vehicles but I persevered in my Ford Windstar and after a slow and torturous progression made it to the end. There, at 5900', the track crossed Indian Creek (flowing at the time, which is rare) and disintegrated into a foot path leading to higher elevations. At 5900' the sheltered canyon supported a small variety of wildflowers, several oaks, juniper and sycamore, but not the truly mesic broadleaved trees and ground plants I generally associate with superb tachinid collecting. I collected along the creek for a day and spent part of another unsuccessfully looking for a suitable route to more mesic habitat, then reluctantly decided to move on to a hopefully more productive locality. I did find a few interesting tachinids, including a record high of nine species at blacklight.

My consistently best collecting site over the years has been Cherry Creek campground at 7400' in the Gila National Forest, 14 miles north of Silver City, New Mexico. The campground is situated in a narrow canyon through which runs Cherry Creek (which flows intermittently) and a road leading to the ancient Gila Cliff Dwellings. Most of Gila National Forest is dominated by Pondersona pine, oaks and junipers but in Cherry Creek Canyon these trees are joined by a host of deciduous trees, shrubs and wildflowers, such as Arizona walnut (*Juglans major*), boxelder (*Acer negundo*), narrowleaf cottonwood (*Populus angustifolia*), smooth sumac (*Rhus glabra*), canyon grape (*Vitis arizonica*), sweet white clover (*Melilotus alba*) and *Ceanothus fendleri*, to name a few.

The tachinid fauna of Cherry Creek Canyon is so diverse that in the 8 times I have visited the canyon I have almost always found undescribed tachinids different from those on other trips. I stopped briefly at Cherry Creek at the beginning of August 1999 but left after two days because of inclement weather. I returned a couple of weeks later near the end of my trip and collected in the area for several days. Through a combination of blacklighting, net collecting and three Malaise traps I caught more rare and undescribed tachinids than I ever have taken before at Cherry Creek. Among the more notable species: *Actia autumnalis* (Townsend) (not recorded west of Missouri by O'Hara, 1991), *Aphanto-*

rhapha n.sp., ?*Aphantorhapha* n.sp., *Carcelia* sp., (either new species or described from Mexico), *Cylindromyia (Ichneumonops) mirabilis* (Townsend) (a rarely-collected wasp mimic; only 4 other specimens in CNC, all from Arizona), *Lypha*-group n.gen. & n.sp. (known from small series in CNC; also collected previously at Cherry Creek), *Lypha*-group n.sp. (genus placement uncertain; same species as small series in USNM taken by Sabrosky from Chiricahua Mountains), *Meleterus montanus* Aldrich (rare in collections), *Phasmophaga meridionalis* Townsend (new record for New Mexico), *Paradmontia picticornis* Reinhard (second known male of this species; first male taken by myself at Cherry Creek in early 1980s), and *Trixodes obesus* Coquillett (relatively rare; rests facing downward on prominent trees; see pictures in online slide show).

By far the best collecting at Cherry Creek is from flowers of *Ceanothus fendleri*. This woody bush grows to a height of about five feet and in July and August boasts a profusion of tiny white flowers (see picture in slide show) which are probably the most attractive to tachinids of any plant at intermediate elevations in the Southwest. The flowers are often conspicuously visited by large and colourful Tachinini, but upon closer inspection a wide variety of smaller tachinids can be found; for example, I have collected at least five new siphonines on the *Ceanothus* of Cherry Creek. I am reminded when collecting from this plant of the following delightful account of collecting at *Ceanothus* by Banks (1912), who wrote: "To stand 'neath the broiling sun and watch this mazy whirl of restless insect life; to hear the hum of a hundred tiny wings, mingled with the sharper buzz of certain species; to easily and stealthily push one's way through the bushes, glancing anxiously here or there for something new, with net in hand a-tremble for a lightning stroke; these are the pleasures of *Ceanothus* collecting that bear pleasant memories on many a wintry day." (Banks, N., 1912: 102, At the *Ceanothus* in Virginia. Entomological News **23**: 102-110).

So as not to prolong this already lengthy trip review, I will but briefly mention the excellent tachinid collecting offered by two localities within a few miles of Cherry Creek: Meadow Creek and Signal Peak. As the name implies, Meadow Creek runs alongside a large meadow (at ca. 7100') thick with grasses, sedges and wildflowers, and harbors a bountiful assortment of tachinids. Signal Peak, at 8900', can be reached by road and is a good hilltopping site for tachinids.

Even after numerous trips to the American Southwest I never cease to be amazed at the incredible diversity of tachinids that the region has to offer. This was reinforced when I returned to Ottawa at the end of this trip with more rare and undescribed tachinids than ever before. The area is incredibly diverse as a result of overlapping Neotropical and Nearctic faunas, a multitude of habitats in disjunct mountain ranges, and climatically varied deserts. I am sure this in part explains why each trip yields but a subsample of the tachinid fauna, but I suspect there is another reason why the results of each trip are so different. Hosts are subject to population fluctuations which cycle over time, and it is likely that the cycles of their parasitoids are not completely synchronized with them and therefore the parasitoids become common only rarely. If this true, then a host which becomes common every 5 or 10 years might support parasitoids which are only abundant after even longer intervals.

Tachinidae captured in the Nepali Himalaya's (by Theo Zeegers)

In the autumn of 1998 I visited Nepal and had the opportunity to collect some Diptera. Since my visit was first and foremost a trekking trip, there was not too much opportunity to collect intensively. Nevertheless, some interesting species have been found. With the help of the publications of Dr. H. Shima, quite a lot of this material could be identified. Here I give the most interesting and reliable results. Not all material could be identified satisfactorily. It seems that at least 3 new species in 2 new genera may be involved. A more detailed report can be obtained from the author.

Manaslu Himal, 29.ix - 16.x.1998 (Manaslu Himal is a mountain-region in central Nepal, just east of Annapurna. It is relatively little visited by tourists.)

Below 1000 m.

Isosturmia picta (Baranov)
Parapales sturmioides Mesnil

Between 1000 - 2000 m.

Gonia chinensis Wiedemann
Allophorophasia sp.
Janthinomyia felderi B. & B.
Thelairoleskia sp.
Atylostoma sp.
Meigenia nr. *velutina* Mesnil

Between 2000 - 3000 m.

Dexiomimops pallipes Mesnil

Above 3000 m.

Meigenia nr. *velutina* Mesnil
Meigenia dorsalis (Meigen)
Tachina (Servillia) nr. *rufa* (Chao)
Pales nr. *coerulea*
Pales nr. *pavida* (Meigen)
Eumea mitis (Meigen)

Tachina (Servillia) bombylia (Villeneuve)
Tachina (s.s.) sp.
Voria ruralis (Fallén)

Nagarkot, 24-27.x.1998, alt. 2000-2164 m. (Nagarkot lies on the eastern border of Kathmandu Valley. It is famous for its magnificant views on the Himalaya's.)

Winthemia angusta Shima, Chao and Zhang
Euphyllophila includens (Walker)
Drino (Palexorista) ?solennis (Walker)
Pales nr. *pavida* (Meigen)
Janthinomyia felderia B. & B.
Austrophorocera hirsuta (Mesnil)
Estheria (Dolichodexia) albipila (Mesnil)
Estheria (Myiostoma) magna (Baranov)
Blepharipa sp.

A collection of tachinids (Diptera, Tachinidae) from Sicily and the Maltese Islands (by H.-P. Tschorsnig and B. Merz)

The present paper gives a list of Tachinidae which were collected during an unusually successful excursion to Sicily and Malta in June 1999 by B. Merz. The 212 specimens represent 70 species, among which 5 species (those marked with two * in the following list) were not yet mentioned for Italy by Pape, Richter, Rivosecchi and Rognes (1995) and additional 46 species (those marked with a single * in the following list) were not yet known from Sicily. Four species (*Thelyconychia solivaga*, *Linnaemya lithosiophaga*, *Zeuxia aberrans*, and *Phasia mesnili*) were not included in the list of Diptera from Malta of Schembri, Gatt and Schembri (1991).

In Sicily, all specimens were collected in the eastern part of the island, mainly around Mt. Etna, in the Nébrodi National Park and around Cesarò, Linguaglossa and Randazzo. In Malta, the western part of the main island and the neighboring island Gozo were visited.

The material was determined by H.-P. Tschorsnig. It is stored in the private collection of B. Merz (except a few duplicate specimens which are stored in the Natural History Museum Stuttgart and in the Natural History Museum Geneva). A few specimens of unidentified *Meigenia* (*mutabilis*-group) and *Gymnosoma* are omitted. The arrangement follows Herting and Deli-Draskovits (1993).

It is a pleasure here for B. Merz to thank Martin J. Ebejer (Balzan, Malta), Paul Gatt (Rabat, Malta) and John C. Deeming (Cardiff, Wales) for their company on the trip and their hospitality during my stay on Malta. Further, we thank sincerely Giorgio Sabella and his collegues from the Catania University for their generous help in showing us the best collecting sites on Sicily.

1. Exoristinae

Exorista segregata (Rondani, 1859): Sicilia - Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 1♂

**Exorista grandis* (Zetterstedt, 1844): Sicilia - Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 1♂

**Chetogena rondaniana* (Villeneuve, 1931): Sicilia - Randazzo, Mt. Spagnolo, 6.vi, 1♂; Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 1♀

Chaetoria stylata Becker, 1908: Malta-Gozo: Ramla Bay, 16.vi, 1♀

**Conogaster pruinosa* (Meigen, 1824): Sicilia - Etna, 3 km NW Milo, 5.vi, 1♀

**Lomachantha parra* Rondani, 1859: Sicilia - Randazzo, Mt. Spagnolo, 6.vi, 1♂

**Compsilura concinnata* (Meigen, 1824): Sicilia - Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 1♂

**Acemya rufitibia* (von Roser, 1840): Sicilia - Etna, Rif. Citelli, 12.vi, 1♂

**Atylomyia loewi* Brauer, 1898: Sicilia - Randazzo, Mt. Spagnolo, 6.vi, 1♂

**Nemorilla maculosa* (Meigen, 1824): Sicilia - Etna, Piano Provenzana, 9.vi, 1♀

**Aplomya confinis* (Fallén, 1820): Sicilia - Etna, 3 km NW Milo, 5.vi, 1♂; Etna, Rif. Citelli, 12.vi, 1♀; Linguaglossa, 6.vi, 1♂, 1♀; Randazzo, Bivio Pirao, 6.vi, 1♂, 1♀; Randazzo, Lago di Gurrida, 11.vi, 1♀; Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 30♂♂

**Phryxe vulgaris* (Fallén, 1810): Sicilia - Nébrodi N.P., Cesarò, 8.vi, 1♀

**Pseudoperichaeta palesoidea* (Robineau-Desvoidy, 1830): Sicilia - Randazzo, Mt. Spagnolo, 6.vi, 1♂; Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 1♀

Lydella stabulans (Meigen, 1824): Sicilia - Nébrodi N.P., 8 km NW Cesarò, 7.vi, 1♀

**Chetina setigena* Rondani, 1856: Sicilia - Randazzo, Lago di Gurrida, 11.vi, 1♀

Thelyconychia solivaga (Rondani, 1861): Malta: Buskett Gardens, 14.vi, 1♂

Carcelia lucorum (Meigen, 1824): Sicilia - Nébrodi N.P., Mt. Soro, 7.vi, 1♂; Nébrodi N.P., Cesarò, 8.vi, 3♂♂

**Erycia festinans* (Meigen, 1824): Sicilia - Nébrodi N.P., 8 km NW Cesarò, 7.vi, 1♂

**Alsomyia capillata* (Rondani, 1859): Sicilia - Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 3♂♂

**Platymya antennata* (Brauer et Bergenstamm, 1891): Sicilia - Randazzo, Bivio Pirao, 6.vi, 1♂

**Erynnia ocypterata* (Fallén, 1810): Sicilia - Etna, Piano Provenzana, 9.vi, 1♀

**Masicera sphingivora* (Robineau-Desvoidy, 1830): Sicilia - Randazzo, Lago di Gurrida, 11.vi, 1♀

**Pseudogonia parisiaca* (Robineau-Desvoidy, 1851): Sicilia - Randazzo, Lago di Gurrida, 11.vi, 1♂

**Pseudogonia rufifrons* (Wiedemann, 1830): Sicilia -

Randazzo, Lago di Gurrida, 11.vi, 3♀♀

2. Tachininae

**Tachina magnicornis* (Zetterstedt, 1844): Sicilia - Etna, Piano Provenzana, 9.vi, 1♀

Peleteria abdominalis Robineau-Desvoidy, 1830: Sicilia - Linguaglossa, 6.vi, 1♂; Randazzo, Lago di Gurrida, 11.vi, 1♀

**Peleteria rubescens* (Robineau-Desvoidy, 1830): Sicilia - Etna, Mareneve, 12.vi, 1♀; Randazzo, Mt. Spagnolo, 6.vi, 2♂♂; Randazzo, Lago di Gurrida, 11.vi, 1♂, 3♀♀; Nébrodi N.P., 8 km NW Cesarò, 7.vi, 1♂; Nébrodi N.P., Troina, Elia River, 8.vi, 1♂

**Peleteria ruficornis* (Macquart, 1835): Sicilia - Randazzo, Lago di Gurrida, 11.vi, 1♂

**Peleteria varia* (Fabricius, 1794): Sicilia - Randazzo, Lago di Gurrida, 11.vi, 10♂♂, 6♀♀

***Linnaemya soror* Zimin, 1954: Sicilia - Randazzo, Lago di Gurrida, 11.vi, 1♀

Linnaemya lithosiophaga (Rondani, 1859): Malta: Buskett Gardens, 14.vi, 1♂

**Zophomyia temula* (Scopoli, 1763): Sicilia - Nébrodi N.P., 8 km NW Cesarò, 7.vi, 2♂♂, 2♀♀

**Loewia brevifrons* (Rondani, 1856): Sicilia - Randazzo, Bivio Pirao, 6.vi, 1♀; Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 1♂, 1♀

**Macquartia chalconota* (Meigen, 1824): Sicilia - Etna, 3 km NW Milo, 5.vi, 1♂

**Macquartia dispar* (Fallén, 1820): Sicilia - Etna, Milo forest, 12.vi, 1♀; Nébrodi N.P., Mt. Soro, 7.vi, 1♂

Macquartia tessellum (Meigen, 1824): Sicilia - Etna, 3 km NW Milo, 9.vi, 1♂; Etna, Rif. Citelli, 12.vi, 7♂♂; Etna, Piano Provenzana, 9.vi, 1♂

**Triarthria setipennis* (Fallén, 1810): Sicilia - Etna, 3 km NW Milo, 5.vi, 1♀

***Neaera atra* Robineau-Desvoidy, 1850: Sicilia - Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 1♂

**Graphogaster vestita* Rondani, 1868: Sicilia - Avola Vecchia, 10.vi, 1♀

**Actia crassicornis* (Meigen, 1824): Sicilia - Randazzo, Mt. Spagnolo, 6.vi, 2♂♂; Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 2♂♂

Actia pilipennis (Fallén, 1810): Sicilia - Nébrodi N.P., 8 km NW Cesarò, 7.vi, 1♀

**Peribaea apicalis* Robineau-Desvoidy, 1863: Sicilia - Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 1♂, 1♀

**Aphria longirostris* (Meigen, 1824): Sicilia - Nébrodi N.P., Troina, Elia River, 8.vi, 1♂

**Bithia modesta* (Meigen, 1824): Sicilia - Etna, 3 km NW Milo, 5.vi, 4♂♂, 1♀; Etna, 3 km NW Milo, 9.vi, 1♀; Etna, Mareneve, 12.vi, 1♂; Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 1♂; Nébrodi N.P., Troina, Elia River, 8.vi, 4♂♂

**Leskia aurea* (Fallén, 1820): Sicilia - Randazzo, Lago di Gurrida, 11.vi, 1♂

**Clausicella puella* (Rondani, 1861): Sicilia - Nébrodi N.P., Troina, Elia River, 8.vi, 2♂♂

Microphthalma europaea Egger, 1860: Malta: Ghadira Beach, 15.vi, 1♀. - Malta-Gozo: Ramla Beach, 16.vi, 1♀

3. Dexiinae

**Dexia rustica* (Fabricius, 1775): Sicilia - Etna, 3 km NW Milo, 5.vi, 1♂; Nébrodi N.P., Mt. Soro, 7.vi, 1♂

Zeuxia aberrans (Loew, 1847): Sicilia - Nébrodi N.P., Troina, Elia River, 8.vi, 2♂♂, 2♀♀ . - Malta: Buskett Gardens, 14.vi, 1♂

***Zeuxia zejana* Kolomiets, 1971: Sicilia - Randazzo, Bivio Pirao, 6.vi, 1♀; Randazzo, Lago di Gurrida, 11.vi, 1♀

**Periscepsia carbonaria* (Panzer, 1798): Sicilia - Etna, Piano Provenzana, 9.vi, 1♂

***Eugymnopeza braueri* Townsend, 1933: Sicilia - Randazzo, Mt. Spagnolo, 6.vi, 1♀

4. Phasiinae

**Clytiomya sola* (Rondani, 1861): Sicilia - Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 1♀; Bronte, Mt.Minardo, 11.vi, 1♀

**Ectophasia crassipennis* (Fabricius, 1794): Sicilia - Randazzo, Lago di Gurrida, 11.vi, 1♂

Ectophasia oblonga (Robineau-Desvoidy, 1830): Sicilia - Randazzo, Lago di Gurrida, 11.vi, 1♂, 1♀; Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 1♀

**Gymnosoma clavatum* (Rohdendorf, 1947): Sicilia - Randazzo, Bivio Pirao, 6.vi, 1♀; Randazzo, Lago di Gurrida, 11.vi, 1♀; Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 2♀♀

**Gymnosoma rotundatum* (Linnaeus, 1758): Sicilia - Nébrodi N.P., 8 km NW Cesarò, 7.vi, 1♂

Phasia obesa (Fabricius, 1798): Sicilia - Nébrodi N.P., 8 km NW Cesarò, 7.vi, 1♀; Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 1♀

**Phasia pusilla* Meigen, 1824: Sicilia - Etna, 3 km NW Milo, 5.vi, 2♂♂; Randazzo, Bivio Pirao, 6.vi, 1♂

Phasia mesnili (Draber-Monko, 1965): Malta: Buskett Gardens, 14.vi, 2♂♂. - Malta-Gozo: Ramla Bay, 16.vi, 1♂

***Leucostoma anthracinum* (Meigen, 1824): Sicilia - Etna, 3 km NW Milo, 5.vi, 1♂

**Leucostoma simplex* (Fallén, 1815): Sicilia - Etna, 3 km NW Milo, 5.vi, 2♂♂; Etna, 3 km NW Milo, 9.vi, 1♀; Nébrodi N.P., Cesarò, 8.vi, 1♀; Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 1♂

Clairvillia biguttata (Meigen, 1824): Sicilia - Randazzo, Mt. Spagnolo, 6.vi, 1♂; Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 1♂

Clairvillia pninae Kugler, 1971: Sicilia - Randazzo, Rummolo, Flascio, 9.vi, 2♂♂; Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 1♂

**Cylindromyia bicolor* (Olivier, 1812): Sicilia - Randazzo, Rummolo, Flascio, 9.vi, 1♀; Randazzo, Lago di Gurrida, 11.vi, 1♂; Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 3♂♂, 1♀

Cylindromyia rufipes (Meigen, 1824): Malta: Salina Bay, 4.vi, 2♀♀

Cylindromyia intermedia (Meigen, 1824): Malta-Gozo: Ramla Bay, 16.vi, 1♂

**Cylindromyia auriceps* (Meigen, 1838): Sicilia - Etna, 3 km NW Milo, 5.vi, 1♀; Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 1♂. - Malta-Gozo: Ramla Bay, 16.vi, 1♂

**Besseria lateritia* (Meigen, 1824): Sicilia - Nébrodi N.P., Troina, Elia River, 8.vi, 1♂

Besseria zonaria (Loew, 1847): Sicilia - Etna, 3 km NW Milo, 5.vi, 1♂; Etna, 3 km NW Milo, 9.vi, 1♂; Nébrodi N.P., Troina, Lago d'Ancipa, 8.vi, 1♀. - Malta: Buskett Gardens, 14.vi, 1♂; Ghadira Beach, 15.vi, 1♂; Fommir-Rih Bay, 14.vi, 1♂

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PERSONAL NOTES

Zdravko Hubenov writes: In 1999 I was working mainly on the biodiversity conservation programme of two of our National Parks. The work concerns the entomofaunistic biodiversity of the parks.

Peter Sehnal writes: I am working on a catalogue of Neotropical and Nearctic tachinid types of the Naturhistorisches Museum Wien (NHM). In 1998 I also started with some field trips to the type localities of *Lydella lacustris* (Burgenland, Austria) which was described by Herting (1959) based on three specimens, collected by Cerny in 1928 but not collected since. I mainly collected with two Malaise traps near the east shore of Lake Neusiedlersee. I could find only *Lydella thompsoni* Herting (1959) and *Lydella stabulans* (Meigen, 1824). The project will be continued again this year. I plan to publish a summary in the new journal "Beiträge zur Entomofaunistik" produced by the new entomofaunistic society in Austria, "Österreichische Gesellschaft für Entomofaunistik". Further, I am working on the faunistics and taxonomy of Palaearctic Phasiinae. For this purpose I have started SEM examinations of egg structures.

Theo Zeegers writes: After the publication of the checklist of Dutch Tachinidae, 7 more species have been found in The Netherlands. Of all of them only 1 or 2 specimens have been caught. Some species are quite spectacular findings indeed. I hope to publish an update to my checklist shortly. Also I hope to publish together with J.T. Smit a checklist of the Tachinidae of Madeira, based on both old and new material. Finally, I have been studying the population dynamics of tachinids with microtype eggs and their hosts mathematically. The first results will appear soon in the proceedings of the conference "Entomologendag 1999" (written in English).

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