CHRYSOMELA newsletter

Dedicated to information about the Chrysomelidae

Report No. 43.2 July 2004

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Fabreries in Fabreland

St. Leon, France

Statue of J. H. Fabre in the garden of the Fabre Museum, St. Leons, France

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Research Activities and Interests

Johan Stenberg (Umeå University, Sweden) Currently working on coevolutionary interactions between the monophagous leaf beetles, *Altica engstroemi* and *Galerucella tenella*, and their common host plant *Filipendula ulmaria* (meadow sweet) in a Swedish Archipelago.

Stefano Zoia (Milan, Italy) Interested in Old World Eumolpinae and Mediterranean Chrysomelidae (except Alticinae) and plans a revision of *Arima* and taxonomic works on the European species of the genera *Pachnephorus* and *Colaspidea*.

Duane McKenna (Harvard University, USA) Currently studying phylogeny, ecological specialization, population structure, and speciation in the genus *Cephaloleia*. Needs Arescini and Cephaloleini in ethanol, especially from N. Central America and S. America.

Amanda Evans (Harvard University, USA) Currently working on a phylogeny of *Leptinotarsa* to study host use evolution. She also plans to carry out population-level studies of several *Leptinotarsa* species. She would like to borrow or exchange specimens of *Leptinotarsa*, *Doryphora*, and other chrysomelines.

Eduard Petitpierre (Palma de Mallorca, Spain) Interested in the cytogenetics, cytotaxonomy and chromosomal evolution of Palearctic leaf beetles especially of chrysomelines. Would like to borrow or exchange specimens from Western Palearctic areas.

Maria Lourdes Chamorro-Lacayo (University of Minnesota, USA) Currently a graduate student working on a comparative prothorax morphology (with Alex Konstantinov) and a catalogue of the neotropical Cryptocephalinae.

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The Editor's Page

Caroline Chaboo, (USA)

Welcome to CHRYSOMELA 2004! We hope you find this edition as informative, entertaining and useful as previous editions. Thank you very much to all who contributed articles and helped with updating and extending our list of readers. Our community has grown to 220 registered readers (and each one will contribute an article in the future!).

This is an exciting period in chrysomelid research – not only have many articles been published since the last edition, but several books have appeared. Single-authored books by Mohamedsaid and Warchałowski, edited volumes by Furth and Jolivet *et al.*, and catalogs by Riley *et al.* and Clark *et al.* span a broad range of topics in Chrysomelidae and greatly lift the level of scholarship in our field. This year is also punctuated by some exciting meetings and we look forward to complete reports in the next edition. The upcoming ICE congress, with the much anticipated Phytophaga symposium co-ordinated by Catherine Duckett and Rolf Oberprieler, presents an exceptional list of speakers and rich potential for community interaction.

Since CHRYSOMELA is now posted on the web, there is no limitation on space, correcting scientific or grammatical errors, or considering serious editorial objections. If you have strong objections, please send an email, and we can revise the web-version. I look forward to your feedback and suggestions for improvements, as well as your articles.

As this edition is my first, I am especially grateful to my predecessor, Terry N. Seeno, for his unwavering support, attention to numerous questions, and ghost-editing this volume. After struggling through InDesign and PageMaker, new programs for me, I certainly have a better appreciation of his dedication, patience and service to our community.

In Memoriam

Renaud Paulian

1913-2003

The French entomologist, Renaud Paulian, passed away on August 16 2003.

He was primarily a specialist of laparostict Scarabaeidae and published over 350 articles and several books mostly focussed on this topic. He studied Chrysomelidae as part of a survey of the Fauna of Madagascar.

Paulian's career began in 1937 at the Paris Museum where he was a favorite student of René Jeannel. His early works were co-published with Julian Huxley (in English), then he focussed on beetles, writing primarily in French. In 1947, he served as Deputy Director of the Institut de Recherche Scientifique de Madagascar. During this period he built a tremendous collection of Chrysomelidae housed in the Malagasy Institute in Antanarivo. Afterwards, he served as Director of the Institut Scientifique de Congo-Brazzaville and head of the local University, then as head of the University of d'Abidjan, Ivory Coast. He returned to France in 1969 as Recteur of the Academy of Amien, and finally as Recteur of the Academy of Bordeaux.

—Pierre Jolivet
June 2004

"Man, is this house heavy!"

Neochlamisus larva with fecal case. Want to know more? Turn to pages 14 & 15.

The Newsletter CHRYSOMELA–*Founded 1979*– is published semiannually, usually in June and December by the American Museum of Natural History, Division of Invertebrate Zoology, Central Park West @ 79th St., New York, NY 10024. E-mail: chrysomela@coleopsoc.org; telephone: (212) 769-5616. This newsletter is sent to students of the Chrysomelidae to encourage the exchange of ideas and to disseminate information on these insects. **Editor:** Caroline Chaboo, New York. **Advisors**: Brian D. Farrell, Cambridge; Dave Furth, Washington; R. Wills Flowers, Tallahassee; Elizabeth Grobbelaar, Pretoria; Pierre Jolivet, Paris; Alex Konstantinov, Washington; Chris Reid, Sydney; Ed Riley, College Station; Al Samuelson, Honolulu and Terry N. Seeno, Sacramento.

In Memoriam

John Avery Wilcox

August 24, 1921 — September 18, 2003

John completes a habitus illustration of Malacorhinus *in 1951 while working at the New York State Museum in Albany.*

John was a native of Ohio, born in LaGrange (Lorain County) where he attended elementary and high school (1927-1939). After his high school graduation, he was enrolled in the biology program at Ohio Northern University in Ada (1939-1941) and then transferred to Ohio State University where he studied until June of 1942. At that time, he entered the U. S. Army where he served in a heavy artillery combat unit in Germany (1942-1945).

When the war ended, he returned to OSU. He received both his Bachelor and Masters degrees in entomology, with additional studies in genetics (1946-1950). During these university years, he worked as an assistant in the insect taxonomy section of the Ohio Insect Survey and as a graduate assistant in the OSU Genetics Department (1946-1948). John developed his initial interest in Chrysomelidae during these years.

Following graduation from OSU, John took the position as Curator of Entomology and Senior Scientist for the New York State Museum and Science Service in Albany (1950-1976). This position afforded him the opportunity to focus more intensely on the leaf beetles. During the following years, John published numerous papers on Chrysomelidae (see below). Perhaps his most important contributions were on his favorite group, the Galerucinae *s. str.* These works include his *Synopsis of North American Galerucinae* (1965) and the *Coleopterorum Catalogus Supplementum* treating the Galerucinae (1971, 1972, 1973 & 1975).

During his years at the Albany museum, he was appointed Director of the Outdoor Education Heldeberg Workshop in Voorheesville, NY where he developed a children's outdoor education program (1969-1972). Additionally, he held the position as Editor of the *Coleopterorum Catalogus Supplementum* (1970-1976), and was Coordinator (as well as a member) of the Advisory Board of the North American Beetle Fauna Project (1973-1977).

On November 22, 1947, he married Virginia (Ginny) Stevenson, who would be his wife for nearly 56 years until his death. John and Virginia had two sons, Keith and Bruce, and both have been honored with chrysomelid generic names: *Brucita* Wilcox, 1965, and *Keitheatus* Wilcox, 1965. The name *Paria virginiae* Wilcox, 1957, honors Ginny.

In 1975 John developed cancer, prompting him to retire from the Albany State Museum and seek employment in what he considered to be a healthier climate. From 1976 to 1977 he was a teacher and lecturer on the natural history of the Cedar Bog area in Ohio. Afterwards, he served a number of years as an adjunct faculty member in the Department of Entomology at Ohio State University.

From 1975 until the time of his death, John was plagued with a number of physical problems. He rarely, if ever, complained about these problems and maintained an up-beat attitude until he finally passed away from heart failure at 7pm on September 18, 2003.

John's enthusiasm for leaf beetles was contagious. Many North American chrysomelid workers, as well as a few from overseas, studied under him. He was a pleasure to work with and will be greatly missed by his family and friends. He is survived by his wife Virginia and two sons, Bruce and Keith.

Terry N. Seeno, Sacramento
Shawn M. Clark, Provo
Edward G. Riley, College Station

May 15, 2004

Publications by John A. Wilcox

1951. A new species and new genus of Galerucinae (Chrysomelidae: Coleoptera). Ohio J. Sci., 51:90-94.

1953. New species of Galerucinae and Alticinae with notes on other species (Coleoptera: Chrysomelidae). Ohio J. Sci., 53:51-58.

1953. Survey and control studies of beetles attacking wind thrown trees in the Adirondacks (with D. P. Connola, C. J. Yops, and D. L. Collins). J. Econ. Entomol., 46: 249-254.

1954. Leaf beetles of Ohio (Chrysomelidae: Coleoptera). Ohio Biol. Survey Bull. 43, pp. 353-506.

1955. On the habits of beetles of the genus *Catops* (Leptodiridae) (with A. H. Benton). Coleopt., Bull. 9:29.

1956. Suggestions for study of insects. Bull. to the Schools, 42:234-237.

1956. Moths and butterflies of New York. NY State Conservationist, June, pp. 23-26 (illust. By Wayne Trimm).

1957. A revision of the North American species of *Paria* Lec. (Coleoptera: Chrysomelidae). NY State Mus. Sci. Serv., Bull. 365, pp. 1-45.

1960. Some beetles of New York. NY State Conservationist, February, pp. 23-27 (illust. By Wayne Trimm).

1962. Some architects of the insect world. NY State Conservationist, April, pp. 23-26.

1965. Some ants of New York. NY State Conservationist, October, pp. 23-27.

1965. A sysopsis of the North American Galerucinae (Coleoptera: Chrysomelidae). NY State Mus. Sci. Serv., Bull 400, pp. 1-226.

1971. *Coleopterorum Catalogus supplementa*, pars 78, Coleoptera: Galerucinae, fasc. 1, pp. 1-220. W. Junk N.V., The Hague, The Netherlands.

1972. *Coleopterorum Catalogus supplementa*, pars 78, Coleoptera: Galerucinae, fasc. 2, pp. 221-431. W. Junk N.V., The Hague, The Netherlands.

1972. A review of the North American chrysomeline leaf beetles. NY State Mus. Sci. Serv., Bull. 421, pp. 1-37.

1972. Entomology projects for elementary and secondary schools. NY State Mus. Sci. Serv., Bull. 422, pp. 1-44.

1973. *Coleopterorum Catalogus supplementa*, pars 78, Coleoptera: Galerucinae, fasc. 3, pp. 433-664. W. Junk N. V., The Hague, The Netherlands.

1975. *Coleopterorum Catalogus supplementa*, pars 78, Coleoptera: Galerucinae, fasc. 4, pp. 667-770. W. Junk N. V., The Hague, The Netherlands.

1975. Goldenrod ball galls. Insect World Digest, 2(2):5-7.

1975. Down in the pawpaw patch. Insect World Digest, 2(2): 14-15.

1975. Flea beetle poison. Insect World Digest, 2(6):14-15.

1975. *The Leaf Beetles. Checklist of the beetles of Canada, United States, Mexico, Central America and the West Indies*. 1(7):1-166, Biological Research Institute of America, Siena College, Loudonville, NY.

1979. *Leaf beetle host plants in northeastern North America (Coleoptera: Chrysomelidae)*, pp. 1-30, North American Beetle Fauna Project. Biological Research Institute of America, World Nat. Hist Pubs. Kinderhook, NY 12106, USA.

1982. *Leaf Beetle Genera (Coleoptera: Chrysomelidae)* (with T. N. Seeno). Entomography, 1:1-221.

Bruce, Ginny, and John pose for a photo in front of the house in Colombus (Spring, 1988).

Remembering John Wilcox

Wills Flowers (USA)

My acquaintance with John was a brief and pivotal point in my life; but just how pivotal went unnoticed for many years. As undergraduates in the College of Agriculture at Cornell University, we had a "summer practice requirement" which meant spending three summers doing something related to the agriculture degrees we all hoped to obtain. During the summers of 1968 and 1969, I boarded a bus in my hometown in western Massachusetts for the hour ride to Albany and the New York State Museum, where I did my summer practice (we didn't call it interning in those days) in the entomology department. John was my supervisor and is was from him that I learned about Chrysomelidae, taxonomy, and taxonomists.

John was a great believer in learning by doing. I was assigned to revise *Psylliodes* (Galerucinae: Alticini), given a collection of specimens, a microscope, and a stack of Xeroxed literature. John sat at a nearby table in the large collection room we had to ourselves, working on his South American galerucines. John had put together a "book" of the Chrysomelidae of North America for our in-house use, making copies of existing keys to genera and species, and cutting and pasting them together into the form of a complete monograph. While we rightly celebrate the recent publication of *Beetles of North America*, we still do not have anything in Chrysomelidae more complete than those two notebooks of John's.

In those days before Photoshop[tm], illustrations were the most time comsuming part of the research. John had prepared a series of hand-drawn grids of various sizes, a project that in itself represented a substantial amount of work, and we made our enlarged drawings by sketching the contents of the ocular grids in our microscopes on paper clipped over one of John's carefully ruled templates. Nowadays in the era of computer-assisted art and reasonably cheap microphotography, I have to smile when I still occasionally hear taxonomists bemoaning the "illustration bottleneck" holding up taxonomic progress.

From John I learned about two of the giants in Chrysomelidae taxonomy who were both alive, publishing, and locked in battle. These, of course, were Doris Blake and Jan Bechyné. Bechyné, at the height of his career in Venezuela, and only a few years before his premature death, had produced an awesome quantity of descriptions and revisionary studies of the Neotropical fauna. Whether the quality of this work was equally awesome was a point that Bake hotly, and Wilcox more genteelly, disputed. Earlier, during his Frey years, Bechyné had "assimilated" the Neotropical Eumolpinae, and John assured me that the taxonomy of this subfamily was now confused beyond all hope of disentanglement. Changing his domicile from Europe to Central America to South America, Bechyné had progressively changed his focus from Eumolpinae to Alticinae and finally to Galerucinae. John and Mrs. Blake seemed to regard these research shifts about the way the cast of Star Trek greets the appearance of a Borg Cube in Federation space.

I didn't realize it at the time, and John never made a point of it, but he had just been "tagged" by a Bechyné publication (Bechyné & Bechyné 1969) that politely called his entire higher classification of the Galerucinae into question. Blake had her own issues, one of which was a recent type trip to various museums and universities throughout South America, only to discover that Bechyné had already borrowed most of the material she went down to see. As an undergrad who even then had decided on some sort of a career in systematics, I enjoyed hearing gossip involving people of evident importance living in big cities and on faraway continents; the professional scrapping between them giving the stories an added bit of fun-not that they would ever have any actual impact on my life. Or so I thought in the summer of '69.

I never saw John again after that second summer in Albany, although we corresponded occasionally during the years immediately afterwards.

The *Psylliodes* project had gone well enough that we were thinking about publication; we found the European *Psylliodes affinis* in the Port of Albany, which was a new record, and several undescribed species in the Southwest. But in spite of my ambitions, my academic career veered toward insect behavior at North Carolina State, then back into aquatic entomology at the University of Wisconsin, then at Florida A&M University. Finishing *Psylliodes* got put on my to-do list where it sits to this day, and Chrysomelidae receded into another memory from college days.

Now we fast forward to the mid 1980's. I was rather cozily ensconced in a small but highly recognized aquatic entomology program, when our higher administrators suddenly decreed that since we were in an "Agricultural" college, all research had to look "Agricultural," like it had just fallen off a turnip truck from the family farm. Faced with showing that my research was acceptably agricultural or rejoining the job hunt with several less fortunate colleagues, I suddenly remembered that deep down I was a Chrysomelidae specialist, and Chrysomelidae were a bloody important group when it came to agriculture.

John's mentoring, and copies of those notebooks, helped me quickly re-tool as a chrysomelid specialist (which easily transformed itself into "agricultural pest specialist" when talking to our local academic bureaucracy). The modest insect collection at FAMU and the much more extensive one nearby in the Florida State Collection of Arthropods gave me a lot of material to work on, both from the Southeastern US and Latin America. While I was content working on local chrysomelids and happy that those two summers in Albany had paid off so handsomely, I had by now acquired a taste for working in the tropics, and my new goal was to somehow find a way to the really fascinating chrysomelids I had seen in Central America.

In 1988 I volunteered to help Dan Janzen with the chrysomelids collected in his inventory project in Costa Rica's Santa Rosa National Park (this project was later to morph into the famous Costa Rican inventory project). Initially, most of my work was separating subfamilies and getting specimens to a new generation of Chrysomelidae specialists: Ed Riley, Charles Staines, Dave Furth, and Shawn Clark. Only the Eumolpinae still sat in my office with no one laying claim to them. The conflict between Blake and Bechyné had become

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folklore among Chrysomelidae workers and American Eumolpinae were now widely regarded as an intractable mess. On the other hand, they were "wide open" for a new worker and, more importantly, largely tropical. Starting in 1991 I joined the Costa Rica National Biodiversity Inventory (INBio) in ernest as a collaborating specialist in Chrysomelidae.

Others who have known and were mentored by John have also joined in INBio's effort as well as the younger ALAS inventory in La Selva. The leaf beetles are now one best identified and most organized families in the INBio collection, as well as in various Costa Rican university collections. This in turn is now attracting students to do more biological and ecological studies on a family that a decade ago no one wanted to touch. The successes we have had in our work on Costa Rica leaf beetles were also John's successes, whether our not they "count" in the usual tallies of a scientist's life work. Neither John nor I had any idea that those two long ago summers would one day help finish the enormous work that he, Doris Blake, and Jan Bechyné had begun.

Now, where did I put those *Psylliodes*?

Bechyné, J. and B. Springlová de Bechyné 1969. Die Galerucidengattungen in Sudbrasilien. Iheringia Zoolgia, 36:1-110.

Defensive Strategies of Two Cassidinae Larvae: the Role of Fecal Shields and Chemical Substances.

Flávia Nogueira de Sá (Brazil)

Chrysomelidae beetles have a great diversity of natural enemies and also exhibit many different defensive strategies. In my PhD research, I investigated the protection of larvae of two Cassidinae species, *Plagiometriona flavescens* and *Stolas areolata*. My main objective was to understand how these species protect themselves against predators using their fecal shields or chemical substances.

I have been studying both species for some years and during this time I have gathered much information on their natural history and enemies (Nogueira-de-Sá & Macêdo 1999; Nogueira-de-Sá & Vasconcellos-Netto 2003a; Nogueira-de-Sá & Vasconcellos-Netto 2003b). These species were therefore ideal subjects for more detailed investigation on defensive mechanisms of the larvae.

I conducted experiments in the field and in the laboratory to evaluate shield protection by comparing the mortality of larvae of both species with their fecal shields maintained, removed, or replaced by an artificial shield (without unpalatable chemical substances). In laboratory experiments I offered larvae to the ant species, *Camponotus crassus* and to chicks, *Gallus gallus*. Field experiments revealed that larvae of both species, with their natural shields, showed higher survival frequency than larvae without shield or with artificial shield. This pattern indicated the chemical nature of the defense. In fact, chemical protection provided by shield of *P. flavescens* was confirmed by high rejection frequency of baits treated with shield extract, both in the field and in laboratory experiments.

Figure 2. Stolas areolata.

Figure 1. Plagiometriona flavescens

On the other hand, in laboratory experiments, the frequency of predation on *S. areolata* by both predators was low, independently of the presence of fecal shield. This result suggested that larvae of this species might rely on another defensive strategy, unrelated to the fecal shield.

I also followed cohorts of larvae (from egg hatch to pupation) of both species, with and without natural shields, in the field and in the laboratory. In *P. flavescens*, I observed that shield maintenance did not represent any cost in the performance and survivorship of the larvae. Therefore, I concluded that, for this species, the fecal shield represents a cheap defense by providing unpalatability to larvae and not because of the physical barrier, as I had hypothesized. Following *S. areolata* in the laboratory, I observed that larvae with shields

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New Zealand Chrysomelidae

Rich Leschen (New Zealand)
& Chris Reid (Australia)

New Zealand is a strange place indeed, if you compare its biological composition to any other continent or archipelago in the world. Sure, everyone is aware of its ratite birds, wingless parrots and waterfowl, and giant weta, but on closer inspection of the less obvious organisms, especially of the Coleoptera, New Zealand is even more mysterious, mainly because of its many endemic family-groups and genera and phylogenetic relationships to other south temperate continents. The beetle fauna may be composed of up to 10,000 species (about 4500 are already described) placed among 82 families and 1090 genera (Leschen et al. 2003) with two endemic families. Not bad for a country almost equal to the size of England. The strange disharmonic diversity of New Zealand is a result of its isolation from other great landmasses since its split from Gondwana some 80 my and in antiquity being an archipelago with diverse topography and climates. So, as to be expected from an island, there are typical radiations of forms in certain groups, but these are also sympatric with ancient species whose ancestors rafted away from Gondwana aeons ago.

Based on mostly published information and work on the Australasian fauna by CR we estimate a total of 156 chrysomelid species present in New Zealand. This number of species includes 19 exotics, 117 native species and 20 additional undescribed species based on examination of specimens in the New Zealand Arthropod Collection (see Table 1). There are possibly three undescribed genera (2 Chrysomelinae (M. Daccordi, pers. com.), 1 Eumolpinae) but there may be additional genera to be discovered once museum material has been studied thoroughly. The number of species may drastically change due to synonymy of many of the presently named species. This is unfortunately the case with many of the names authored by Thomas Broun in the late 1800s and early 1900's. Broun was New Zealand's prolific beetle taxonomist who was responsible for the naming of most of the country's species, and he is also infamous for over-describing the number of species in many genera. We suspect that the number of species described for some genera will be reduced significantly, in particular, in *Adoxia*, *Arnomus* and other genera in Eumolpini, Galerucini, and Chrysomelini, even though there are new species in some of these (there are at least 3 new spp. of *Arnomus*).

One of the mysteries of the New Zealand fauna is the absence of certain groups, and this is particularly interesting for Chrysomelidae. Notably lacking are Criocerinae, Cassidinae, Spilopyrinae, Sagrinae and non-phyllocharitine Chrysomelinae. These groups may either (i) have evolved subsequent to the 80 my rifting that sent New Zealand adrift; (ii) gone extinct; or (iii) never occurred on the New Zealand islands because of lack of suitable hosts or climate. Meanwhile, there is a relatively high diversity of Phyllocharitini (*Aphilon* and its relatives), which could represent a New Zealand radiation. Also within chrysomelines, we predict that native members of the tribe Gonioctenini may be discovered, if fieldwork is concentrated on *Nothofagus* leaf-flush.

We can try to place New Zealand's taxa into a broader biogeographic context. All eumolpines appear to belong to the '*Colaspoides*' assemblage that is diverse in Australia and New Caledonia. All native cryptocephalines belong to Arnomus which is sister to Semelvillea in Tasmania and eastern Australia (Reid 1991) while all galerucines belong to the '*Monolepta*/*Adoxia* /*Candezea*' assemblage, abundant from Africa to Australia. Alticines may have dispersed to New Zealand (Samuelson 1973, except maybe Alema), and along with galerucines and eumolpines, all of these groups belong to relatively derived taxa scattered throughout Southeast Asia, Australia and the western Pacific region. We speculate that most chrysomelids, except for phyllocharitines and perhaps a few other other isolated genera, may represent New Zealand radiations after dispersal to the continent. This pattern is also one seen in the majority of plant groups that occur in New Zealand. Dispersal to New Zealand is a continuing process, aided by humans, as seen in Table 1 where all Bruchinae, about a third of alticines, and 7 Gonioctenini are deliberate or accidental recent introductions.

Future directions for New Zealand chrysomelids are obvious, reflecting the poor knowledge about many of the New Zealand families. All groups of New Zealand Chrysomelidae require revision in order to document the species, stabilise the taxonomy, and provide a useful classification. We are still uncertain about the number of species in many groups, the fauna can't be readily identified to species, and plant hosts and immature stages are poorly known. Also part of our wish list is phylogenetic information for chrysomelids so that we can understand the biogeographic history and evolution of host plant use for the New Zealand fauna. Only then, with proper documentation and phylogenetic data, will the broad biogeographic patterns we provide above be tested.

References

Daccordi, M. 1994. Notes for phylogenetic study of Chrysomelinae, with descriptions of new taxa and a list of all the known genera (Coleoptera: Chrysomelidae: Chrysomelinae) [pp. 60-84]. *In*: Proceedings of the Third International Symposium on the Chrysomelidae, Beijing, 1992 (D. G. Furth, editor). Backhuys, Leiden.

Leschen, R.A.B., J. F. Lawrence, G. Kuschel, S. Thorpe, & Q. Wang. 2003. Insecta: Coleoptera: Genera of New Zealand. New Zealand Entomologist (in press).

Reid, C. A. M. 1991. A new genus of Cryptocephalinae from Australia (Coleoptera : Chrysomelidae). *Entomologica Scandinavica* **22** : 139-157.

Samuelson, G. A. 1973. Alticinae of Oceania (Coleoptera: Chrysomelidae). Pacific Insects Monograph 30: 1-165.

Table 1. List of genera and family group placement with number of described species listed. A = adventive. In the following list we have disregarded changes made to the Chrysomelinae by Daccordi (1994). These changes were made without empirical study and have yet to be justified (some

(continued on next page)

(*New Zealand Chrysomelidae,* continued from page 7)

made to the New Zealand fauna are also no longer considered valid by him (M. Daccordi, in litteris).

Bruchinae

Acanthoscelides (1, A)
Bruchidius (1, A)
Bruchus (1, A)
Callosobruchus (2, A)

Galerucinae

Galerucini

Adoxia (49)
Allastena (4)
Bryobates (4)

Alticini

Agasicles (1, A)
Alema (2)
Altica (1, A)
Chaetocnema (5)
Disonycha (1, A)
Longitarsus (3, 2A)
Phyllotreta (1, A)
Pleuraltica (1)
Psylliodes (1, Kermadec Islands)
Trachytetra (2)

Chrysomelinae

Allocharis (11)
Aphilon (9)
Caccomolpus (15)
Chrysolina (1, A)
Chrysophtharta (1, A)
Cyrtonogetus (1)
Dicranosterna (1, A)
Eualema (1)
Paropsis (1, A)
Peltoschema (1, A)
Trachymela (2, A)

Eumolpinae

Atrichatus (2)
Eucolaspis (6)
Peniticus (5)
Pilacolaspis (5)

Cryptocephalinae

Arnomus (8)
Aporocera (1, A) (=*Ochrosopsis*[1])
Ditropidus[2] (1, A)

[1]Synonymy not formally published but treated as such in current Australian literature.
[2]The species of *Scaphodius* described from New Zealand appears to belong to an acacia-feeding group of Australian *Ditropidus* and is likely to be mislabelled or adventive.

(***Defensive Strategies***, *continued from page 6)*

had higher mortality than larvae without shield. I did not find, however, any difference in the performance of larvae with or without shield. Nevertheless, in the field experiment, I did not detect any significant difference in the mortality of larvae with or without shield. In this case, I concluded that this structure in S. areolata may have a different function than protecting larvae against predators.

I also tested the efficiency of other strategies of chemical defense. I observed that *P. flavescens* larvae protect themselves against chemically-oriented predators by chemical camouflage. Cuticular hydrocarbons of larvae have a high similarity

Figure 3. Flavia takes a break in the lab.

to the hydrocarbons of their host plant, *Aureliana fasciculata* (Solanaceae). For this reason, *C. crassus* ants were not able to find and attack *P. flavescens.* I also observed, in laboratory experiments, that baits treated with the apolar extract of larvae of *S. areolata* are rejected by *G. gallus*. Therefore, it is possible that such substances could be potentially defensive to *S. areolata* larvae.

The importance of this work relies on the demonstration that different species, even belonging to the same sub-family, show different types of protection against predators. Since *P. flavescens* and *S. areolata* may not be attacked by the same predators, I suggest that differences in defensive strategies reflect the impact of different enemies on each species. In addition to that, results obtained in my study showed that generalizations on the efficiency of defensive mechanisms of Cassidinae beetles may not be appropriate even for closely related species.

Literature cited:

Nogueira-de-Sá, F. & M.V. Macêdo 1999. Behavior and population fluctuation of *Plagiometriona flavescens* (Boheman) (Chrysomelidae: Cassidinae). In: Cox, M.L. (ed.). Advances in Chrysomelidae Biology 1. Backhuys Publishers, Leiden, pp. 299-305.

Nogueira-de-Sá, F. & J. Vasconcellos-Neto 2003a. Natural enemies of Neotropical cassidinae (Coleoptera: Chrysomelidae) and their phenology. In: Jolivet, P. & D.G. Furth (eds.). Special topics in leaf beetle biology. Proceedings of the Fifth International Symposium on the Chrysomelidae. Pensoft Publishers, Sofia, pp. 161-174.

Nogueira-de-Sá, F. & J. Vasconcellos-Neto 2003b. Host plant utilization and population abundance of three tropical species of Cassidinae (Coleoptera: Chrysomelidae). J. Nat. History 37: 681-696.

Collecting in Sholas Forests, India

K. D. Prathapan (India)

A field trip in search of flea beetles was organized from 13th November to 2nd December, 2003 in south India after the luxuriant monsoon rains. Kumar Ghorpade, Alexander Konstantinov Sergei Saluk, and I participated in the trip. Though it rained occasionally, the weather was cool and pleasant. Local arrangements and collecting site plans were made by Kumar Ghorpade. The main destinations were the mountains of the Western Ghats and Eastern Ghats. Western Ghats is the chain of mountains along the western edge of Peninsular India while Eastern Ghats form the eastern border of the Peninsula marked by broken series of isolated hills. Western Ghats is amongst the 25 biodiversity hotspots identified in the World.

Figure 1. (from left) S. Saluk, A. Konstantinov, K. D. Prathapan, Ravi (driver)

South India is known for the unique shola-grass land ecosystems. Sholas are patches of dense isolated forests composed of evergreen trees occurring along the folds of mountains often associated with a stream in the middle. The term "shola" in vernacular means shade. Sholas are the most valuable treasures of the hills with vast stretches of grass lands in between. These are the terminal refuges for endangered species of flora and fauna. They are considered living fossils for their sheer antiquity and virtual non-regeneration. Unfortunately most of these invaluable habitats have already been lost to commercial plantations of tea, *Eucalyptus* and *Acacia* besides indiscriminate felling. During the trip we came across instances of deforestation and forest degradation which are still rampant.

Figure 2. Long Wood Shola, one of the pristine habitats in the Nilgiris, India.

Though appear uniformly green and lush, the insect fauna of shola forests vary greatly from niche to niche in terms of species composition and diversity. Leaf beetles were abundant along the margins of forests rather than the deep jungles. To collect in sholas one needs to have a strong net with a handle long enough to reach the canopy as several species occur on trees.

Collecting was started at Devarayanadurga with many specimens of *Elytropachys* on *Dioscorea* and . Other common genera were also found at the same site. The rare South Indian flea beetle *Mesopa fulvipes* was collected on flowers of *Polygonum chinense* in Nilgiris. A species of *Philogeus* collected on Berberis and a single specimen of an undermined wingless genus found on moss in Nilgiris were total surprises. *Aphthona*, in general, feed on trees belonging to Euphorbiaceae in south India. We found isolated trees of *Chrozophora*, *Mallotus* and *Macaranga* teeming with *Aphthona*. *Philogeus* and *Ogloblinia* feed on Piperaceae and Menispermaceae in south India. Western Ghats is the home for several species of *Piper* (*P. nigrum*, black pepper or the King of spices originated here). At least six species of flea beetles are associated with members of this genus in south India. Species of *Longitarsus* were collected on Boraginaceae, Acanthaceae and Lamiaceae. Beautiful green and blue *Chalaenosma*, an endemic genus, was present on every hill. A few species of *Aphthonoides* were also common. The rarely collected *Ivalia* proved to be a spectacular example of the unknown diversity of south India. We collected good series of over 15 species of *Ivalia* (only two named species occur here). Sifting moss on tree trunks and rocks led by Sergei Saluk yielded both alate and apterous forms of this poorly known genus. Each niche appeared to have its own species of *Ivalia*. Other genera collected include *Argopistes*, *Hemipyxis*, *Hyphasis*, *Jacobyana*, *Manobia*, *Manobidia*, *Nisotra, Ophrida, Orthaltica, Phaelota, Philopona, Podontia, Sinocrepis, Trachyaphthona* etc. The common genera *Chilocoristes, Lipromorpha, Panilurus* and *Schenklingia* eluded us even after several days of field work.

Blood sucking leeches present on moist forest floor were really troublesome. A pinch of salt sprinkled on a leech relishing blood would at once help to detach it from the body and kill it instantaneously by exosmosis. Mosquito repellent spray also deterred leeches to a limited extent. Collecting clothes were treated with a synthetic pyrethroid against ticks. We were lucky enough never to encounter wild elephants while collecting, but took photographs of a wild herd of the pachyderms in the Bandipur National Park.

We traveled over 3000 km that enabled us to sample the rich and wonderful leaf beetle fauna of south India. At the end of the trip we had 90+ species of flea beetles including several new species and a few unnamed genera.

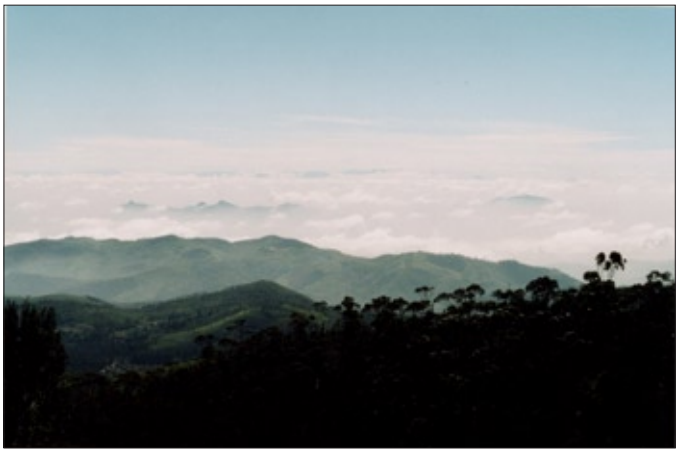

Figure 3. View from the top of Mount Doddabetta in Nilgiri.

Fun With Flea Beetle Feces

David G. Furth, (USA)

Most Flea Beetles (Alticinae) do not have any unusual fecal behavior. Like most insects they defecate whenever and wherever they feel like it. Adults they usually randomly drop feces on the surface of leaves or any other surface they happen to be on. However, there are a few known cases of species or even genera that have special fecal behavior that seem to have some beneficial aspects to them. Probably the best example of such special fecal-frolicking is in the genus *Blepharida* Chevrolat, 1836. As I reported previously (Furth 1982) the female adults of *B. sacra* (Weise) (Sacred Sumac Flea Beetle) cover each small batch of eggs (average 9-10 eggs per batch) with feces that hardens into a sort of "egg case" on the older branches or twigs of its food plant, the *Rhus tripartita* (Bernard da Ucria) (Anacardiaceae) (Fig. 1). The fact that these egg cases are usually on older branches may also protect them from the grazing by goats on the newer, more tender twigs. Because this species usually lives in rather harsh environments (deserts or xeric habitats) the presumption is that this hardened fecal covering (egg case) serves as protection from desiccation or from certain kinds of egg predation (Furth, 1982, 1985). These egg cases may remain on the host tree for several years, indicating the presence of a population of the beetles even during the off-season. The slug-like larvae of *B. sacra* appear somewhat wet or slimy, but actually they only have a very smooth transparent outer integument. They also have interesting fecal behavior in that they retain the feces as long "fecal threads" that extend as very long filaments from the anus, often several times their body length (Furth, 1982) (Fig. 2). It unclear what the purpose of this behavior is, except possibly as some sort of anti-desiccation mechanism. The fecal threads are able to be maintained because of the unusually high position of the anus above the anal proleg in *Blepharida* and its relatives, moreso than in other Alticinae (Paterson, 1931, Furth & Lee (2000). I have observed *B. marginalis* Weise and *B. conradsi* (Weise) in Kenya (Furth & Young, 1988) that exhibited some of the same larval fecal thread behavior, but to a lesser extent. Similar "egg case" and "fecal thread" behavior have been reported for the Australian weevil *Goniopterus scutellatus* Gyll. (Arzone & Meotto, 1978).

Figure 1. Egg of Blepharida sacra *coated with feces*

Figure 2. Larva of Blepharida rhois *covered with feces*

Another "use" of the fecal threads is as indicators for entomologists to locate populations of larvae, because when you see pieces of the fecal threads on leaves of the host, you only have to look on branches above these pieces to find the larvae.

An even better known case is the behavior of *B. rhois* (Forster) the jumping sumac beetle from North America that feeds on several species of sumac (*Rhus*), the larvae of which are well-known to cover themselves in fresh feces giving a wet, sticky appearance (Fig. 3). Morris (1916) said "the larva is one of the most disgusting sights in the insect world". The presumed advantage of this behavior is that a larva completely covered in feces cannot be seen by many potential predators. However, recently, Vencl & Morton (1998) demonstrated that the feces of this species (and presumably others) contains chemical deterrents to ants. Evans et al. (2000) determined that the feces of *B. schletendalii* (Furth) contain some of its host plant chemicals that presumably act as a defense. However, I have not observed these fecal behaviors (fecal threads or fecal shields) in most of the other species of New World or Old World *Blepharida*.

Figure 3. Larvae of Blepharida rhois *covered with feces*

References:

Arzone, A. and F, Meotto. 1978. Reperti biologici su *Goniopterus scutellatus* (Gyll. (Col. Curculionidae) infestante gli Eucalipti della Riviera Ligure. Redia 61:205-222.

Evans, P. H., J. X. Becerra, D. L. Venable and W. S. Bowers. 2000. Chemical analysis of squirt-gun defense in *Bursera* and counterdefense by chyromelid beetles. Journal of Chemical Ecology 26(3): 745-754.

Furth, D. G. 1982. *Blepharida* biology, as demonstrated by the Sacred Sumac Flea Beetle (*B. sacra* Weise). Spixiana, Supplement 7:43-52.

Furth, D. G. 1985. The natural History of a sumac tree, with an empha sis on the entomofauna. Transactions of the Connecticut Academy of Arts and Sciences 46:137-234.

Furth, D. G. 1998. New World *Blepharida* Chevrolat, 1836 (Coleoptera: Chrysomelidae: Alticinae). Memoirs of the Entomological Society of Washington No. 21:1-109.

Furth, D. G. and J. E. Lee 2000. Similarity of the *Blepharida*-Group genera using larval and adult characters (Coleoptera: Chrysomelidae: Alticinae). Journal of the New York Entomological Society 108(1-2):26-51.

Furth, D. G. and D. A. Young 1988. Relationships of herbivore feeding and plant flavonoids (Coleoptera: Chrysomelidae and Anacardiaceae: *Rhus*). Oecologia 74:496-500.

Morris, F. J. A. 1916. Division No. 5, Port Hope District. 46th Report of the Entomological Society of Ontario 1915. No. 36:17-21.

Paterson, N. F. 1931. Early stages of two species of Halticinae (Chrysomelidae, Coleoptera). Journal of the Entomological Society of South Africa 6:29-36.

Vencl, F. V. and T. C. Morton 1998. The shield defense of the sumac flea beetle, *Blepharida rhois* (Chrysomelidae: Alticinae). Chemoecology 8:25-32.

Whither South African Cassidine Research?

Hugh D. C. Heron (South Africa)

Hugh collecting in South Africa

After the Neotropics, Africa (including Madagascar) is one of the world's richest regions for cassids, with over 600 described species (Borowiec 1994). At least 117 species, belonging to 20 genera, are known from South Africa. Much of the pioneering work was done by three giants of the early days of cassidine taxonomy: Boheman, Spaeth and Weise. South Africa was the type locality for numerous species although the region was not known by that name until 1910 when the two British colonies (Cape and Natal) and the former Boer Republics (Oranje Vrij Staat and Zuid Afrikaansche Republiek) merged to become Provinces in the new Union of South Africa.

1904-1993: a slow start

One hundred years ago, Muir & Sharp (1904) gave a new direction to South African cassidine research with descriptions of immatures of eight species in the genera *Aspidimorpha*, *Conchylotenia* and *Cassida* from Durban, Natal. Since then, very little has been done on South African cassidines and only five publications have appeared. Nellie Paterson (1941; Witwatersrand University) described early stages of four South African chrysomelids, including three cassidine species. The popular book, African Insect Life by Dr. S. H. Skaife (1953) included a brief description of a green cassid whose identity is still uncertain, but was almost certainly a member of the genus *Cassida*, possibly *C. pudens* Boh. The revised edition of this book included illustrations and the life cycle of an *Aspidimorpha* species, almost certainly *A. tecta*. A third paper, Shaw (1956) recorded nomenclature and localities of the southern African cassidines then represented in the collections of the Durban Museum (South Africa) and Manchester Museum (Britain). Finally, Siebert (1975) looked two New World cassids, *Gratiana lutescens* (Boh.) and *G. pallidula* (Boh.) as possible controlling agents of the exotic invasive weed *Solanum eleagnifolium* Cav. (Solanceae), and concluded that release of these species in South Africa was not recommended. Olckers & Hulley (1989) studied the impact of *Conchylotenia tripuncticollis* Oliv. upon indigenous and exotic Solanum plants in the eastern Cape.

1994-2003: a fresh impulse

The publication of parts 1 (1994), 2 (1997), and 3 (2002) of the proposed 6-part Monograph of the Afrotropical Cassidinae by Lech Borowiec has brought order and clarity to our understanding of the African fauna. For the first time, a revision, keys, figures, host plant data and description of immature stages have been presented for African cassidines, new species have been described, and some have been synonymized. These publications and Borowiec's (1999) catalog of Cassidinae (and website: www.biol.uni.wroc.pl/cassidinae/katalog%20internetowy/index.htm) have created a firm foundation of African cassidine research. Borowiec and Swietojanska (2002) and Swietojanska and Borowiec (2002) together added seven new species.

Some recent papers have focused on the biology, ethology and ecology of some South African species. Heron and Borowiec (1997) listed all known host plants of South African cassidines, and Rice (2003) added some new hosts. Heron (1992, 1995) discussed cycloalexic behavior and arachnid predators of two species, *Aspidimorpha puncticosta* and *Conchylotenia punctata*. Biological reports on Conchylotenia punctata (Heron 1999) and *Laccoptera cicatricosa* (Heron in press), and *Hybosinota nodulosa* (Heron 2003b) along with an annotated list of the cassidine fauna of North Park Nature Reserve, near Durban (Heron 2003b) have added further information. Sparks (1999) and Williams (2002) dealt with the release of the South American species, *Charidotis auroguttata* Boh., in South Africa to deal with an exotic invasive plant, *Macfadyena unguis-cati* L. Kleinjan and Scott (1996) examined several *Cassida* species as biocontrols of a local plant, *Chrysamthemoides monilifera* (L.), which has become an invasive problem in Australia. Three species included in this study were described as new species by Borowiec and Swietojanska (2002).

Other papers citing South African cassidines include Hinton (1976), Neville (1997) and Parker *et al*. (1998) which all discussed multi-layer light reflectors in beetles. Zaitsev (1989) focused on Ethiopian cassid species but some of these occur in South Africa.

With a View to the Future

In the coming years, Borowiec will publish volumes 4-6 of his Afrotropical Cassidinae series. This will include new species descriptions and the first systematic revision. Biological studies of *Aspidimorpha areata*, *A. submutata*, *Cassida dorsovittata*, *C. innotata* and *C. viridipennis* are also nearing completion (Heron, in prep.). A collaboration with Dr. Swietojanska (Poland) will examine *Aethiopocassis vigintimaculata*.

South Africa, and Africa in general, faces enormous problems from human population pressures and resultant habitat destruction. Although no research has been done, it is possible that some cassidines may be under threat of extinction. Almost nothing is known about certain cassidines, e.g., *Notosacantha*, and many have not been recorded again since their initial description. In South Africa, the use of marginal lands, coupled with periodic droughts, puts pressure on fragile ecosystems. Thoughtless habitat destruction, such as the complete elimination of the Manguzi Forest in Zululand, is cause for concern. An additional problem is that of the paucity of workers. In South Africa, Beth Grobbelaar, of the Plant Protection Research Institute, Pretoria, holds the unique distinction of being the only full-time professional chrysomelidologist in the country. Heron is the only resident currently working on Cassidinae.

The early pioneers and current researchers of Cassidinae are building knowledge of Cassidine species and distributions

in Africa. However little is being done on their habits and biology. Popular articles, e.g. Vincent Wager's (1981) gardening magazine article on A*spidimorpha puncticosta*, help to address this problem by making cassidines more familiar to people. Hamish Robertson of the South African Museum, Cape Town, has included *Aspidimorpha tecta* in the Museum's website:

www.museums.org.za/sam/resource/ento/tepics/num

Much more can be done along these lines. Steps in this direction include the catalog website of Borowiec with photographs of every South African species and Heron's (in prep.) key to South African species.

For the moment, low literacy, poverty and political instability will keep the African populace ignorant of their fauna. The challenge of cassidine research in Africa is daunting but steps are being made at the southern tip of the continent. For both professional and amateur, scientist and hobbyist, the tortoise beetles of South Africa present exciting opportunities.

Selected Reading

(continued on page 20)

Indian Cassidinae Revisited

Hemant V. Ghate, (India)

I am a zoologist with varied interests. Until 1990s I concentrated on experimental work but kept doing taxonomy of freshwater fishes and amphibians around our city. I never thought I would ever take up insect taxonomy or biology and that a group of beetles will keep me occupied for many years and will become my passion!

I became interested in Cassidinae beetles due to *Craspedonta leayana*. Some 12 years ago, while moving around in the Botanical Garden in the Pune University campus I witnessed a moderate size *Gmelina aroborea* tree almost totally occupied by this beetle. Every leaf had bunches of larvae or pupae and there were several brightly colored imagines. The leaves were nearly completely skeletonized and both larvae and imagines were feeding everywhere. There were a number of mating pairs. I was fascinated by these brilliantly colored beetles, their beautiful looking pupae (that 'stand up' when prodded) and strange looking bunch of larvae with a tuft of long "hair-like" processes at the posterior end. In the two weeks that followed (during August) I could collect all the various instars and a few adults and decided to identify that beetle. After some browsing in books at hand and with the help from ZSI, Kolkata, the beetle was identified as *Craspedonta*. Little did I know then that I would soon come across many more species related to *Craspedonta* and that Cassidinae would become major concern of my research work.

Figure 1. H. V. Ghate (left) works with his student Nilesh Ranade

As I was reading through Maulik's Fauna of British India volume on Cassidinae, I remember photographing similar larvae that were resting in a characteristic manner under an *Ipomoea* leaf. The larvae were not identified then but with the help of a couple of students I found those larvae again and reared them: those turned out to be *Aspidimorpha miliaris* larvae in cycloalexy. At the same place we found another type of larvae and pupae which were subsequently identified to be of *Aspidimorpha sanctaecrucis*. My students, Mr. Nilesh Rane and Mr. Sachin Rande, were soon initiated in this work and we three formed a team and decided to scan the area around Pune City for these beetles.

It then became a routine week-end work to examine all the nearby vegetation where we saw feeding marks on the leaves and sure enough we collected some 20 different species in no time. While this was going on we contacted Dr. Michael Cox (then of IIE, London) and Dr. C.R. Basu (ZSI, Kolkata) for help with respect to recent literature and taxonomy.

After this initial work we contacted Prof. Lech Borowiec (Wroclaw University, Poland) and for the past 7 years or so we are jointly exploiting systematics of Cassidinae of our area. Prof. Borowiec has been helping us for all these years otherwise we would not have achieved what we have so far. He is a constant source of inspiration, provides exact information on species variations, makes available rare literature and examines our problematic material readily. We depend heavily on him and now we have a permanent collaboration.

Initially we were mainly interested in correct taxonomic identity of all the species around us but, while we were doing that, we also noted the host plants, feeding patterns, ootheca deposition of the various species and started rearing these beetles under laboratory conditions. We had obtained Dr. Matsuzawa Takizawa's excellent early paper on Indian species and we started studying our material in similar fashion. Over a period of 3 years we got fully acquainted with the oothecae, larvae and pupae of most species that were around but some species eluded us and some continue to elude us even today! We have explored many areas with rich vegetation around Pune and a full list of nearby species and their host plants along with the feeding patterns of the species has been recently published (*Genus*: December 2003).

Figure 2. (l. to r.) Cassida flavoguttata, Chiridopsis ventralis, *and* Laccoptera (Sindia) sulcata.

We have also explored different localities in the southern Western Ghats and collected material while our students in the North East India contributed material from their areas. We have over 70 different species now and we plan to collect extensively in South India this year, if we get financial assistance. We believe it will be a major concerted effort with respect to Indian species of Cassidinae after a prolonged period of neglect. I am saying so because apart from a handful of workers, there are no laboratories involved in work on Cassidinae in India.

So far we have described 2 new species under the genus *Chiridopsis*, 1 under *Notosacantha* and 1 species of *Cassida* awaits description. We also described briefly larva/pupa of *Notosacantha vicaria* and have some more interesting observations on this species. The host plant (*Carallia brachiata*: family Rhizophoraceae) belongs to a new host family for Cassidinae. Family Apocyanaceae plant, *Carissa congesta,* used by *Notosacantha severini,* is another new record of a host plant family. *Epistictina* was found on a plant belonging to family Bignoniaceae (*Stereospermum colais*), a family known to be used by Cassidinae in the New World but not known to be a host plant in the Orient at least. We

Figure 3. Chiridopsis bipunctata *images from Pune. All are from the same single population. The photographs were taken of freshly preserved specimens.*

are looking for host plants for a maximum number of species around and also trying to get immature stages.

We have made some interesting observations on the larvae/pupae of *Notosacantha*. It appears that the mining larvae move through one leaf and just prior to pupation either change the leaf or select a better part of the same leaf. Other mining larvae generally do not leave larval mines to pupate elsewhere but *Notosacantha* seems to be an exception. The pupal mine / chamber has a characteristic shape and the larva takes about 1 hour to prepare the mine. The whole sequence is shown in a series of photographs. The pupa in this genus is not attached to the leaf (like those of other Cassidinae) but is mobile in the mine. It tends to position itself such that the long, posteriorly directed, spiracles on the 5th segment just come close to the opening of the pupal chamber.

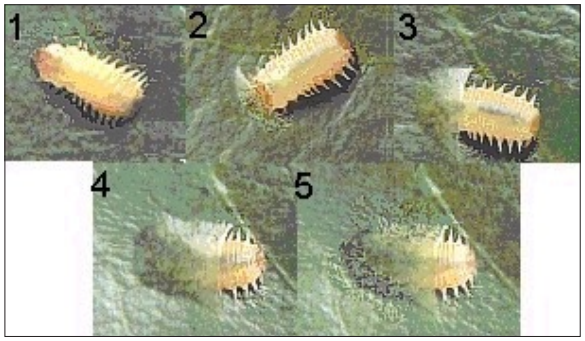

Figure 4. Notosacantha *larva: mining stages.*

The pupa is mobile and, when disturbed, crawls further inside the chamber. This typical spiracle is surely an adaptation for the mining life style, just as a long posterior spiracle in larva is. SEM observations on the larvae and pupae of *Notosacantha* showed special cuticular tubercles and spiniform or digitiform processes (cuticular scales?) on their ventral surfaces that may be helping in better adhesion. The larvae and pupae *Notosacantha* are very similar to those of the *Platypria echidna* and *P. erinaceous* (formerly placed under Hispinae, as in Maulik's Fauna). The latter are also leaf miners that complete their entire development within the leaf mine and are a minor pest on *Zizyphus* plants. *Notosacantha* species are very rare and it is very difficult to locate a population. Only once we came across a rich population of *N. severini* when practically every plant had a few beetles. Since then these beetles are elusive.

Another interesting find was *Laccoptera foveolata*, a beetle till then known only from Burma (Myanmar) and one which is very similar to the African species *Laccoptera cicatricosa* (described and illustrated in Borowiec's Monograph on Afrotropical Cassidinae). In future we hope to compare immature stages of the two species, and, if possible, compare sequences of certain genes as well. A paper on detailed life history of this species is underway. We have also made additional observations on another *Laccoptera*, namely *Laccoptera sulcata* and these will be soon published in J. Bombay Natural History Society.

Together with Prof. Borowiec and Dr. Jolanta Swietojanska we are studying first and last instar larva of the available Cassidinae. We have so far described details of larvae and pupae of a few species of *Chiridopsis* and also *Craspedonta leayana*. These papers are already published. About 15 more species have been studied and a comparison will be attempted when we have studied all the available genera.

Thus we have so far attempted to contribute towards understanding the biology of some Indian Cassidinae, a rather neglected group in our area. We have successfully filled some lacunae while doing this work. Most of the work early work was carried out without any financial assistance but I must acknowledge support (for part of the work) from University Grants Commission (two separate Minor Research Grants awarded to H.V. Ghate) and a grant received through IISc, Bangalore, through Prof. Madhav Gadgil. Encouragement and support from my Institution, Modern College, and Departmental Colleagues is also with me.

The work underway includes comparative morphology (as revealed by SEM) of the antennae of the various Cassidinae genera we have. Some of the photographs will show interesting features of antennae in *Craspedonta* and *Platypria*.

Neochlamisus—Cryptic Speciation in Cryptic Case-bearers?

Danial J. Funk (USA)

Chlamisines include 12 genera and over 500 species of case-bearing leaf beetles and are found in all major zoogeographical regions of the world (Karren 1970). *Neochlamisus* (Karren) is a North American chlamisine genus of 17 species that is divided into two geographically distinct species groups (Karren 1972). According to molecular phylogenetic study (Funk 1999), the *gibbosus* species group represents a monophyletic eastern North American lineage that descends from within the *velutinus* species group, whose species occupy the southwestern U.S., Mexico, and Central America. This phylogeographic pattern accords well with Karren's (1970) hypothesis that North American chlamisine lineages represent northern migrations from an ancestral center of diversity in South America. Adult *Neochlamisus* are 2.8 – 4.5 mm in length, with females being the larger sex. Sexes can also be distinguished by shape differences (e.g., Adams and Funk 1997), the pronounced fovea on the last abdominal tergite of females, and often by increased size and number of tibial spines on the prothoracic legs of males (Karren 1972).

These univoltine beetles are intimately associated with their host plants throughout their life cycle. Adults emerge from a winter diapause in late spring and commence mating and feeding on their hosts. Each female lays her eggs singly, connecting each egg to the host (usually to a leaf) via a sticky thread, then twisting the egg with her hind legs while shaping her emerging feces into a neatly bell-shaped case that completely entombs the egg. Hatchling larvae cut themselves free of this case but continue to live within it throughout their four larval instars (LeSage 1984). Head and legs project from the case's opening, allowing larval movement and feeding, and the body is bent so that the anus is also near the opening, providing material for case enlargement as the larva matures. During development, some taxa incorporate pubescence from host foliage into the case, sometimes to the degree that it resembles a miniature colored cotton ball. After completing development on the natal host plant, the larva seals the case opening to the host substrate with its feces, pupates, and ultimately cuts away a perfectly circular 'cap' (which often remains attached by a small 'hinge') from the rear of the case and emerges as an adult. Adults feed and mate on their hosts until entering winter diapause in late fall. Diapause sites are undetermined.

Figure 1. An individual egg case of the Neochlamisus bebbianae *maple host-form.*

While the larval case surely provides a physical defense from predators (Root and Messina 1983), it may also have a cryptic function, especially during pupation, prior to which individuals often position themselves so that they resemble buds or galls or blend in with stems. It is the adults, however, who are the true masters of crypsis. Although newly eclosed individuals reveal beautifully metallic reflections when viewed under a microscope, from a greater distance they most closely resemble the frass of large caterpillars. This visual trick is provided by a nearly cubical shape (when dropped, they occasionally land 'sitting', bolt upright, on their pygidium!), a complex pattern of elytral and pronotal tubercles and carinae that provide a very irregular and non-insect-like appearance, and an ability to tuck legs and antennae into ventral grooves. After years of working with these animals, I still receive the occasional squishy surprise when reaching for a presumed beetle and have learned the value of looking more closely at what first appear to be droppings. Some *Neochlamisus* species also exhibit differences that appear to promote host-specific camouflage. *N. velutinus*, for example, is specific to mesquite and has an unusual shape and smoky blackish coloration that closely resemble portions of host twigs.

Figure 2. Neochlamisus *larva with fecal case*

My own research interests in *Neochlamisus* focus especially on the evolution of their host relations and how host-associated divergence drives species formation. For the most part, each *Neochlamisus* species primarily uses a single genus or even a single species of woody plant, though among them these represent a diversity of plant families (Table 1). The exceptions to these rules are a few species that use herbaceous hosts (particularly *Rubus*), and one seemingly oligophagous species, *N. bebbianae*, that uses host plants from six genera belonging to five biologically disparate plant families (Table 1). William Brown worked out much of the natural history of northeastern *Neochlamisus* and described a number of species after recognizing that host association was of great taxonomic value in this group (Brown 1943, 1946, 1952, 1961; see also LeSage 1984, Neal 1989). For example, Brown went so far as to describe alder, hazel, and willow-feeding populations of *Neochlamisus* as separate, cryptic species. This taxonomic decision was based entirely on subtle pigmentation differences and field observations, such as the beetles' use of certain of these hosts but not others at particular sites. In revising the North American Chlamisinae, Karren (1972) later synonymized Brown's cryptic species under *N. bebbianae* after finding no consistent morphological differences among them.

Following Brown's intuitions, I have been using *N. bebbianae* as a model system for studying the role of host-associated ecological divergence in speciation (Funk 1998, Funk et al. 2002, unpublished data). These studies document host-use

Figure 3. Neochlamisus *larva with fecal case*

patterns in the field, host preference and host performance traits, mating preferences, and patterns of molecular genetic variation. The recent focus of my lab has been alder-, maple-, and willow-associated populations – or, as I refer to them, 'host forms' – of *N. bebbianae* from eastern North America. If *N. bebbianae* is really a single oligophagous biological species, as assumed under present taxonomy, what should these studies reveal? They should show each host form: (1) to exhibit similar patterns of acceptance of alder, maple, and willow foliage; (2) to randomly mate with other host forms; and (3) to exhibit no molecular genetic substructure as a function of host plant. What do these studies actually show? First, they reveal that each host form uses foliage from its native host most readily and effectively, indicating patterns of ecological specialization by each host form and of ecological divergence between host forms. Second, they reveal patterns of host-associated positive assortative mating, such that individuals of each host form tend to mate more readily with individuals of their own host form than with individuals of different host forms. Third, mitochondrial gene trees and haplotype frequencies demonstrate patterns of genetic substructuring along host plant lines that indicate reduced gene flow between host forms. All these patterns hold up in sympatric comparisons of host form populations living on trees that intermingle at individual localities. In sum, *N. bebbianae* seems to represent an ongoing adaptive radiation, with different host forms existing at different stages of ecological differentiation and speciation.

For those interested in finding these wonderful animals, look especially on succulent, meristematic foliage of their host plants (Table 1). The most reliable source of these animals are soft, pubescent sycamore leaves and various *Rubus* species such as blackberry, both of which regularly support *Neochlamisus* populations over much of eastern North America. As geographic patterns of variation play a vital role in my ongoing studies of these animals, any specimens or locality, host plant, or other information on these curious chrysomelids would be gratefully received.

Table 1. Species and host associations of Neochlamisus

	Principal host plants	
Species	**Latin names**	**Common names**
Gibbosus group		
N. assimilis	*Azalea* spp. (Ericaceae)	azalea
N. bebbianae	*Acer rubrum* (Aceraceae), *Alnus* spp. (Betulaceae), *Betula nigra* (Betulaceae), *Corylus americana* (Corylaceae), *Quercus* spp. (Fagaceae), *Salix bebbiana* (Salicaceae)	red maple, alders, river birch, American hazel, oaks, Bebb's willow
N. bimaculatus	*Rubus* (Rosaceae)	blackberry
N. chamaedaphnes	*Chamaedaphne calyculata* (Ericaceae)	leatherleaf
N. comptoniae	*Myrica peregrina* (Myricaceae)	sweet fern
N. cribripennis	*Vaccinium* spp. (Ericaceae)	blueberry
N. eubati	*Rubus* (Rosaceae)	blackberry
N. fragariae	*Fragaria* (Rosaceae)	strawberry
N. gibbosus	*Rubus* (Rosaceae)	blackberry
N. insularis	---	
N. platanus	*Platanus occidentalis* (Platanaceae)	sycamore
N. tuberculatus	*Vaccinium* spp. (Ericaceae)	blueberry
Velutinus group		
N. memnonius	---	
N. moestificus	*Eriogonum* (Polygonaceae)	buckwheat
N. scabripennis	*Larrea tridentate* (Zygophyllaceae)	creosote
N. subelatus	*Larrea tridentata* (Zygophyllaceae)	creosote
N. velutinus	*Prosopis velutina* (Fabaceae)	mesquite

References:

Adams, D., and D.J. Funk. 1997. Morphometric inferences on sibling species and sexual dimorphism in *Neochlamisus bebbianae* leaf beetles: multivariate applications of the thin- plate spline. Systematic Biology 46: 178-192.

Brown, W.J. 1943. The Canadian species of *Exema* and *Arthrochlamys* (Coleoptera, Chrysomelidae). Canadian Entomologist 75: 119-131.

-----. 1946. Some new Chrysomelidae, with notes on other species (Coleoptera). Canadian Entomologist 78: 47-54.

-----. 1952. Some species of Phytophaga (Coleoptera). The Canadian Entomologist 84: 335-342.

-----. 1961. Notes on North American Chrysomelidae (Coleoptera). Canadian Entomologist. 93: 966-977.

Funk, D.J. 1998. Isolating a role for natural selection in speciation: host adaptation and sexual isolation in *Neochlamisus bebbianae* leaf beetles. Evolution 52: 1744-1759.

Funk, D.J. 1999. Molecular systematics of COI and 16S in *Neochlamisus* leaf beetles and the importance of sampling. Molecular Biology and Evolution 16: 67-82.

Funk, D.J., K.E. Filchak, and J.L. Feder. 2002. Herbivorous insects: model systems for the comparative study of speciation ecology. Genetica 116: 251-267.

Karren, J.B. 1970. Zoogeography of the chrysomelid subfamily Chlamisinae (Coleoptera). The Radford Review 24: 129-142.

-----. 1972. A revision of the subfamily Chlamisinae of America north of Mexico (Coleoptera: Chrysomelidae). University of Kansas Science Bulletin 49: 875-988.

LeSage, L. 1984. Immature stages of Canadian *Neochlamisus* Karren (Coleoptera: Chrysomelidae). Canadian Entomologist 116: 383-409.

Neal, J.W. 1989. Bionomics of immature stages and ethology of *Neochlamisus platani* (Coleoptera: Chrysomelidae) on American sycamore. Annals of the Entomological Society of America. 82: 64-72.

Root, R.B., and F.J. Messina. 1983. Defensive adaptations and natural enemies of a case-bearing beetle, *Exema canadensis* (Coleoptera: Chrysomelidae). Psyche 90: 67-80.

In Memoriam

J. Gordon Edwards

August 24, 1919 — July 19, 2004

Gordon and Alice Edwards relax during an off-trail climb to Snow Moon Lake in Glacier National Park. Photo taken by Tom Kotynski in 2002.

Gordon's unexpected death was recently reported in the *Great Falls Tribune* on July 21, 2004. He died while mountain climbing in Glacier National Park, Montana. To his friends and students, Gordon was respectfully known as "Doc." He always had time to talk about beetles and help his students. His energy seemed endless and it's probably safe to say that he mentored and influenced more than a hundred students in during his teaching career. I can't think of anyone with as much raw energy or who gave of himself to such an extent. A detailed write-up of his life and work on chrysomelids is in preparation. He will be missed by all that knew him.

The following information was taken from that news article written by Eric Newhouse (*Tribune* Projects Editor):

ST. MARY -- J. Gordon Edwards, who wrote the book on climbing in Glacier National Park, died of a heart attack Monday on Divide Mountain. He was 84.

"J. Gordon and his wife Alice were walking up the east side of Divide Mountain to an old lookout site when he collapsed and ultimately died," said a friend, Steve Frye, the park's head ranger.

"If you had to script Gordon's last few hours," Frye added, "I suspect there wouldn't be a much better script than what played out."

"He picked a beautiful place to die," said his daughter Jane Edwards. "It was right above a quarry with a beautiful view of the upper and lower valleys.

Edwards, a retired entomologist at San Jose State in California, wrote the book, *A Climber's Guide to Glacier National Park*.

He released the copyright to the Glacier Natural History Association, said park spokeswoman Amy Vanderbilt, and all the royalties from the guide have been donated to the association. She said Edwards was known as "Glacier's patron saint of climbing."

Terry N. Seeno—Sacramento
July 24, 2004

Whither South African . . .

(Heron article continued from page 11)

Borowiec, L. 1994. A monograph of the Afrotropical Cassidinae (Coleoptera: Chrysomelidae). part 1. Introduction, morphology, key to genera, and reviews of the tribes Epistictini, Basiprionotini and Aspidimorphini (except the genus *Aspidimorpha*). Polish Taxonomical Society, Wrocław, 276 pp.

Borowiec, L. 1997b. A monograph of the Afrotropical Cassidinae (Colopera: Chrysomelidae). Part II. Revision of the tribe Aspidimorphini 2, the genus *Aspidimorpha* Hope. Wrocław, Poland, 596 pp.

Borowiec, L. 2002. A monograph of the Afrotropical Cassidinae (Colopera: Chrysomelidae). Part III. Revision of the tribe Cassidini 1, except the genera *Aethiopocassis* sp., *Cassida* L., and *Chiridopsis* sp. Wrocław, Poland, 292 pp.

Cooper, M. R. And D. C. Cooper. 2002. The Emperor Moths of KwaZulu-Natal. Peroniceras Press: Pietermartizburg.

Heron, H. D. C. 1992. Cycloalexy in two South African beetles (Chrysomelidae: Cassidinae). Chrysomela 27: 3.

Heron, H. D. C. 1999. The biology of *Conchylotenia punctata* (Fabricius) - a cycloalexic cassid (Chrysomelidae: Cassidinae). pp. 565-580. *In*: Cox, M. L. (ed.), Advances in Chrysomelidae Biology. Backhuys Publishers, Leiden, vol. 1: 671 pp.

Heron, H. D. C. 2003. Tortoise beetles (Chrysomelidae: Cassidinae) and their feeding patterns from North Park Nature Reserve, Durban, KwaZulu-Natal, South Africa. Durban Museum Novitates 28: 31-44.

Heron, H. D. C. 2004. The biology of *Laccoptera cicatrosa* (Boheman, 1855) (Coleoptera, Chrysomelidae, Cassidinae). pp. 171-184. *In*: Jolivet, P., J. Santiago-Blay and M. Schmitt (eds.), New Contributions in Biology of the Chrysomelidae. Kugler Publications, the Hague, 803 pp.

Heron, H. and L. Borowiec. 1997. Host plants and feeding patterns of some South African tortoise beetles (Coleoptera: Chrysomelidae: cassidoid Hispinae). Genus 8(3-4): 625-658.

Kleinjan, C. A. and Scott, J. K. 1996. South African Cassidinae. Annals of Applied Biology 128: 373-385.

Olckers, T. and P. E. Hulley. 1989. Seasonality and biology of common insect herbivores attacking *Solanum* plants in the eastern Cape Province. Journal of the Entomological Society of South Africa 52(1): 1-15.

Paterson, N. F. 1941. The early stages of some South African Chrysomelidae (Coleoptera). Journal of the Entomological Society of South Africa 4:1-15.

Rice, M. E. 2003. New host plant associations and distribution records for tortoise beetles (Coleoptera: Chrysomelidae: Cassidinae) from southern Africa. Coleopterists Bulletin 57(1): 79-83.

Shaw, S. 1956a. Some records of South Africa Cassidinae (Col. Cassidinae). **Durban Museum novitiates** 4: 257-272.

Fabreries in Fabreland

Pierre Jolivet (France)

Several recent visits to Fabre's houses in Saint Leons du Lavezou and in Serignan brought me back many memories. Of course, I never met the great entomologist who lived during the Second Empire, but I met his son in Serignan in 1951, the famous Paul-Henri, the "petit Paul", who was the faithful guard of Fabre's empire and died at a very old on the

Figure 1. Fabre Museum, St. Leons, France

06. 01.1967. St Leons and Serignan are holy places for Fabre worshippers, still many in France and in Japan. There are not so many British and American fans since Fabre (Favret, 1999) is supposed to have practically ignored Darwin and evolution. However, in the entomological library of the Natural History Museum, in London, a bust of the entomologist is shown on the shelves. In the harmas, there are also several letters written by Darwin to the patriarch of Serignan. Other places, where Fabre spent part of his life, like Montpellier, Avignon, Ajaccio did not keep many souvenirs of his stay. The talented Yves Delange has recalled the life of Jean-Henri Fabre in Souvenirs Entomologiques (1989), in various other books (1981 *et al*.) and in a feistchrift volume (1986). Fabre was a great naturalist, talented writer, mathematician, physicist, chemist, painter, composer, and a poet. He was good at everything.

I visited Serignan three times , the last in July 1999. At that time, it was not permitted to take a picture of his house, of his hat, of his small table, where he wrote, without any erasure, his unforgettable prose. It was a new regulation and everything was supposed be done after agreement with the keepers at the Museum of Natural History, in Paris. Only a picture in the garden was then tolerated. The house needed repair but the garden is planted with many Mediterranean and exotic plants which Fabre did not see during his life time. This is a bit sad especially, if you had seen the garden in the 1950s kept as it was during the old times. However, the collections are still well kept and, on the wall, a box of chrysomelids is fixed with a nail. Now the house is repaired and gardens rebuilt under the supervision of Anne-Marie Slezec, from the Paris Museum. Let us see how it will appear when finished probably in 2004. I must say also that in 2003, Fabre was viciously attacked in a recent book, Patrick Tort (2003), because of his anti-darwinism, by a philosopher, not a naturalist.

Fabre, in his Souvenirs, tells the story of various leaf-beetles, namely of *Crioceris*, *Lilioceris*, *Clytra*, *Cryptocephalus*, *Chrysomela,* and of *Timarcha* which he did not like much it appears. He seems to have mistaken the reddish-orange "sputum" rejected by *Timarcha* around the mouth as real blood, when it is only regurgitation resembling cases of several tenebrionids, like *Pimelia*, but his observations on diet are worth considering. Outside *Galium verum*, larvae taste many other plants without really feeding on them. Recent papers by Poinar *et al*. (2002-2004) have enlarged the trophic spectrum of *Timarcha*, mainly among two subgenera in the US and Northern Europe. *Vaccinium* seems to have been common basic food at the origin of the genus, being separated now into two main distribution areas. Many of Fabre's original observations on leaf-beetles are interesting and advanced for his time, e.g., the observations on *Clytra* mating, the faecal egg-case, etc. Lecaillon (1898a & b) who popularized the topic. Fabre did not believe, however, in mimetism and did not realize that if the *Crioceris* is red over a green plant, it is not mimetism, but aposematism.

St Leons, which I visited earlier, is developing quickly. Outside the small house where Fabre was born and the pretty little museum and the bronze statue, on the hill, the architects have built a modern disneyland with all the effects of holography and virtual imagery on the world of Insects, directly inspired from the film Microcosmos. The building dug inside the hill cost millions of US dollars and opened spring of 2000. People interested can consult Micropolis 43, rue Béteille, F-12000 Rodez, France. The visit for an adult cost around 10 euros, less for groups or children. The exterior of the building reproduces the undulating movement of a caterpillar, and the front facade the facets of the eyes of the insects. A specially built highway reaches the place and it

Figure 2. Fabre's office, Sérignan, Vaucluse, France

Figure 3. Fabre Display, including the famous hat, in Yokohama, Japan

seems that, since the construction is deeply buried into the ground, the little village of St Leons appears unchanged in the vicinity. Relationships between insects and plants are also part of the exhibit. Theatre, auditorium, restaurants, 11 theme galleries are part of the complex. I must say that during my last visit to the complex in 2003, I was a bit disapointed by the building and its contents. The butterfly farm had only three butterflies…. Many exhibitions, including the beetles, were poor. This system reflects either for future improvements. An exhibition like the beautiful "Insects" in Paris Museum, which for strange reasons has been suddenly closed, would have fitted in St Leons very well, among Fabre relics. The Japanese, who have recreated in Japan the harmas, the buildings, and St Leons' statue, and who are even selling copies of Fabre's hat and table, could have realized a much better unit. A small bookshop completes the unit, but the book collection is rather poor, and should be greatly enlarged with French and English books and, if Fabre's books are sold, the ignominious Tort pamphlet remains off limits!

Although Fabre was indifferent to evolutionary concepts, he was a wonderful observer and a pioneer in insect biology, soon imitated by several US and British entomologists, especially in India and other parts of the Tropics. What if his renovated house in Serignan or his birthplace in St Leons became a "Fabreland"? I am not against it, even if I would like a more sophisticated display. People opinion varies on those « fabreries » but we must probably go with our time. *Ad majorem Fabri gloriam* or *Sic transit gloria mundi* ! It is to the visitor to choose.

References:

Anonymous. 1933. Guide de l'Harmas de J.-H. Fabre à Sérignan (Vaucluse). Museum National d'Histoire Naturelle, Paris. 1-13.

Anonymous. 1986. Actes du Congrès Jean-Henri Fabre. Anniversaire du Jubilé (1910-1985). Le Léopard d'Or, Paris. 198 pp.

Anonymous. 2002. Actes du Colloque International sur l'Entomologie. 18-19 0ctobre 2002. Conseil général de l'Aveyron, Saint-Léons-en-Lévézou. 275 pp.

Delange, Y. 1981. Fabre, l'homme qui aimait les insectes.J.-C. Lattès publ., Paris : 352 pp.

Delange, Y. 1985. Album de famille et lieux privilégiés de Jeazn-Henri Fabre. Actes Sud, Avignon, France. 107 pp.

Fabre, J.-H. 1989. Souvenirs Entomologiques. Robert Laffont publ., Paris. 2 vols. : 1138 + 1187 pp. Preface by Y. Delange.

Favret, C. 1999. Jean-Henri Fabre. His life experiences and predisposition against darwinism. American Entomologist. 45 (1) : 38-48.

Lécaillon, A. 1898a. Sur les enveloppes ovulaires de quelques chrysomélides. Arch. Anat. Microsc. 2: 89-117.

Lécaillon, A. 1998b. Recherches sur l'œuf et sur le développement embryonnaire de quelques Chrysomélides.

Poinar, G, P. Jolivet, and A. Grafteaux. 2002. New Food-Plants provide clues for the origin and distribution of *Timarcha*. Lambilionea 102 (1) : 103-109.

Poinar, G. and **P. Jolivet**. **2004**. Origin of *Timarcha*. Trophic relationships between the Old and New World. In New Developments in the Biology of Chrysomelidae. Jolivet, P., Santiago-Blay, J. & Schmitt, M. (eds.). SPB Academic Publishers, The Hague, The Netherlands : 281-290..

Tort, P.. 2002. Fabre. Le Miroir aux Insectes. Vuibert/Adapt. Paris : 352 pp.

Research Activities and Interests

(continued from page 1)

Catherine N. Duckett (Smithsonian Institution and RutgersUniversity, USA) Since Catherine last reported in to CHRYSOMELA she has been awarded an NSF ADVANCE grant to reconstruct the phylogeny of the Flea beetles using molecular and morphological techniques. Representative lineages of flea beetles (Alticini) and the major traditionally galerucine tribes will be studied. The grant was written for her to do molecular work at Rutgers with Karl Kjer for the first 18 months of the grant and then to transfer to Smithsonian to work on morphology with Alex Konstantinov. She is currently finishing up the molecular phase of the work having extracted and sequenced DNA from approximately 100 genera of Flea beetles, 9 Chrysomelinae, and a sampling of Galerucinae s.s. Catherine is now based in Washington and has also replaced Chuck Bellamy as one of the associate Coleoptera editors at Zootaxa.

Although the data matrix is almost completed about 5 genera are still needed. Catherine reports-" I will be most grateful for any specimens collected into alcohol or dried specimens collected in the last five years from the following genera: *Buphonella* or *Gastrida*, *Amphimela*, *Cardax* or *Mniophila*. I can extract the specimen by using 2 legs or by soaking the entire body in solvents; a procedure that does NOT damage the specimens exoskeleton. All loaned specimens will be vouchered and returned to the lender or deposited in the collection of the collectors preference; and the collector will be acknowledged. I really appreciate your help, thanks!"

Literature on the Chrysomelidae

Aslan, I., H. Özbek, and A. Konstantinov. 2003. Flea beetles (Coleoptera: Chrysomelidae) occurring on *Amaranthus retroflexus* L. in Erzurum Province, Turkey, and their potential as biological control agents. Proc. Entomol. Soc. Wash. 105(2): 441-446.

Bedzék, J. 2003b. Studies on Asiatic *Apophylia* (Insecta: Coleoptera: Chrysomelidae). Part 1: new synonyms, lectotype, designations, redescriptions, descriptions of new species and notes (Coleoptera: Chrysomelidae: Galerucinae). Genus 14(1): 69-102.

Bedzék, J. 2003b. Studies on Asiatic *Apophylia* (Insecta: Coleoptera: Chrysomelidae). Part 2. Revision of the *aeruginosa* and *lebongana* species groups. Stutt. Beitr. Z. Natur. A 649(11): 1-11.

Bedzék, J. 2003c. Studies on Asiatic *Apophylia* (Insecta: Coleoptera: Chrysomelidae). Part 3. Revisional study of type materials and descriptions of eight species new to science (Coleoptera: Chrysomelinae: Galerucinae). Genus 14(2): 191-230.

Bedzék, J. and A. Bedzék. 2003. Book review "Biology of leaf beetles." Eur. J. Entomol. 24: 24

Beenen, R. 2003a. *Galeruca* (*Galemira* n. subgen.) *subcosta* n. sp. from Pakistan (Coleoptera: Chrysomelidae). Stutt. Beit. Natur. Ser. A, 648: 1-9 pp.

Beenen, R. 2003b. New records of *Xanthogaleruca subcoerulescens* (Weise) in southern Turkey (Coleoptera, Chrysomelidae, Galerucinae). Ent. Bla. 99: 99-103.

Borowiec, L. 2003. Two new species of *Spilophora* Boheman, 1850 (Coleoptera: Chrysomelidae: Cassidinae) from Ecuador and Peru. Annales Zoologici 53(4): 710-704.

Borowiec, L. 2004. *Trilaccodea meridionalis* n. sp., with a key to the genus *Trilaccodea* (Coleoptera: Chrysomelidae: Cassidinae). Genus 15(1):109-112, 6 figs. in 1 plate.

Borowiec, L. and M. Skuza. 2004. The structure of spermatheca in the genus *Chelymorpha* Chevrolat, 1837 (Coleoptera: Chrysomelidae: Cassidinae) and its taxonomic significance. Annales Zoologici 54(2): 439-451.

Borowiec, L. and J. Świętojańska. 2003. The first instar larva of *Cassida nebulosa* L. (Coleoptera: Chrysomelidae: Cassidinae) – a model description. Annales Zoologici 53(2): 189-200.

Chaboo, C. S. 2004. Natural history observations in *Eurypepla calochroma* Blake (Chrysomelidae: Cassidinae: Physonotini). Coleopterists Bulletin 58(1): 142-143.

Clark, S. M., D. G. LeDoux, T. N. Seeno, E. G. Riley, A. J. Gilbert, and J. M. Sullivan. 2004. Host Plants of Leaf Beetle Species Occurring in the United States and Canada. Coleopterists Society Special Publication No. 2, Sacramento, 476pp.

Daccordi, M. 2003a. New species of Chrysomelinae from New South Wales (Coleoptera Chrysomelidae: Chrysomelinae). Monogr. Mus. Reg. Sci. Nat. Torino. 35: 379-412.

Daccordi, M. 2003b. New taxa of Chrysomelinae of Queensland (Coleoptera Chrysomelidae: Chrysomelinae). Monogr. Mus. Reg. Sci. Nat. Torino. 35: 413-460.

Daccordi, M. 2003c. New species of Chrysomelinae in the Northern Territory (Coleoptera Chrysomelidae: Chrysomelinae). Monogr. Mus. Reg. Sci. Nat. Torino. 35: 461-502.

Daccordi, M. and D. W. de Little. 2003. New taxa of Chrysomelinae of Tasmania (Coleoptera Chrysomelidae: Chrysomelinae). Monogr. Mus. Reg. Sci. Nat. Torino. 35: 343-378.

Döberl, M. and A. Konstantinov. 2003. A new genus of flea beetles from Nepal (Coleoptera: Chrysomelidae). Coleop. Bull. 57(2): 205-218, 45 figs.

Eisner, T. 2003. For the love of insects. Belknap Press, Cambridge, 448 pp. (Chapter on *Hemisphaerota cyanea* (Cassidinae: Hemisphaerotini).

Erber, D. and L. Medvedev. 1999. Zur Taxonomie der Gattung *Smaragdina* Chevrolat (Coleoptera: Chrysomelidae: Clytrinae), mit Beschreibungen neuer Taxa aus Asien. Stuttgarter Beitr. Naturk. Ser. A 601:1-10, 31 figs.

Erber, D. and L. N. Medvedev. 2002. New and poorly known Clytrinae from Southern Africa. Part 1 (Insecta, Coleoptera, Chrysomelidae). Mitt. Mus. Nat.kd. Berl., Dtsch. entomol. Z. 78(2): 197-206, 21 figs.

Erber, D. and L. N. Medvedev. 2002. Untersuchungen zur Taxonomie afrikanischer Megalopodinae mit Beschreibungen einer neuen Gattung und fünf neuer Arten (Coleoptera, Chrysomelidae). Entomol. Basil. 24:97-121, 96 figs.

Furth, D. (ed.). 2003. Special topics in leaf beetle biology. Proceedings of the Fifth International Symposium on the Chrysomelidae. Pensoft, Sofia-Moscow, 340 pp. [22 articles, 38 authors].

Gómez-Zurita, J. 2003. Book review "Biology of leaf beetles." Systematic Entomology 28: 275-276.

Gross, J., N. E. Fatourous, and M. Hilker. 2004. The significance of bottom-up effects for host plant specialization in *Chrysomela* leaf beetles. Oikos 105(2):368-.

Heron, H. D. C. 2003. Tortoise beetles (Chrysomelidae: Cassidinae) and their feeding patterns from North Park Nature Reserve, Durban, KwaZulu-Natal, South Africa. Durban Museum Novitates 28: 31-44.

Jolivet, P. 1999. Courtship and mating behaviour among leaf-beetles. In: Some Aspects on the Insight of Insect Biology, pp: 115-125. Sobt and Yadav, (eds.). Narendra Publishing House, Delhi.

Jolivet, P. 2001. High Altitude Chrysomelidae. In: Ecology of Desert environments, pp: 293-300. I. Prakash, (eds.) Scientific Publishers (India), Jodhpur. ISBN: 81-7233-288-2.

Jolivet, P. 2001. What is a Chrysomelid? Nouv. Revue Ent. (N. S.) 18(2): 135-146, 6 figs., 1 tab.

Jolivet, P. and K. K. Verma. 2002. Biology of Leaf Beetles. Intercept, Andover, 332 pp. (reviewed by Bedzék and Bedzék, 2003).

Jolivet, P., K. K. Verma and C. Mille. 2003. Biology and taxonomy of *Bohumiljania caledonica* Jolivet (Col., Chrysomelidae). Nouv. Rev. Ent. (N. S.) 20(1): 3-22.

Jolivet, P., J. A. Santiago-Blay and M. Schmitt (eds.). 2004. New developments in the biology of Chrysomelidae. SPB Academic Publishing, the Hague, 803pp. [53 articles, 99 authors].

Kalaichelavan, T., P. Jolivet, K. K. Verma and S. Douget. **2001**. *Chaetocnema confinis* Crotch in India (Coleoptera, Chrysomelidae, Alticinae). Nouv. Revue Ent. (N. S.) 18(3):241-243,

Kalaichelvan, T., K. K. Verma, and B. N. Sharma. 2003. Experimental, morphological and ecological approach to the taxonomy of Oriental *Lema* species (Insecta: Coleoptera: Chrysomelidae). Bonn. Zool. Beitr. 4: 255-260.

Kantner, F. and M. Ouda. 2003. First record of *Labidostomis (Labidostomis) lepida* (Coleoptera: Chrysomelidae) from Slovakia. Klapalekiana 39: 67.

Kim, S. J., K. M. Kjer and C. N. Duckett. 2003. Comparison between molecular and morphological-based phylogenies of galerucine/alticine leaf beetles (Coleoptera: Chrysomelidae). Insect Syst. and Evol. 34(1): 53-64.

Kimoto, S. 2004. New or little known Chrysomelidae (Coleoptera) from Nepal, Bhutan and the northern territories of Indian subcontinent. Bull. Kitakyushu Mus. Nat. Hist Ser. A, 2:47-63, 6 figs.

Konstantinov, A. 2003. Chrysomelidae: aquatic leaf beetles of China. Pp. 563-572. Jach and Ji (eds.), Water beetles of China., vol. III.

Konstantinov, A. and B. A. Korotyaev. 2004. Sexual dimorphism and size of aedeagi in apionid weevils (Coleoptera: Apionidae) flea beetles (Coleoptera: Chrysomelidae): why some masculine males have small aedeagi. Proc. Entomol. Soc. Wash. 106(2): 324-338.

Konstantinov, A. and A. Tishechkin. 2004. The first Neartic leaf litter flea beetle (Coleoptera: Chrysomelidae) from the Great Smoky Mountains National Park. Coleop. Bull. 58(1): 71-76.

Lays, P. 2003. Observations de formations tératologiques parmi des donacies (Coleoptera Chrysomelidae Donaciinae). Bull. S. R. B. E./K. B. V. E. 139: 180-183.

Medvedev, L. N. and D. Erber. 2003. New species of Afrotropical Clytrinae (Coleoptera: Chrysomelidae), with new data on several known species. Annales of the Transvaal Museum 40: 73-90, 43 figs.

Medvedev, L. N. and F. Kantner. 2003. Description of a new species of *Cheilotoma* Chevrolat, 1837 (Coleoptera: Chrysomelidae) from Turkey. Entomol. Zeit. 113(9): 268-269.

Mohamedsaid, M. S. 2004. Catalogue of the Malaysian Chrysomelidae (Insecta: Coleoptera). Pensoft, Sofia-Moscow, 239 pp.

Narita, Y. 2003. Descriptions of Donaciine larvae (Coleoptera: Chrysomelidae) from Japan. Elytra, Tokyo, 31(1): 1-30.

Petitpierre, E. and I. Garnería. 2003. A cytogenetic study of the leaf beetle genus *Cyrtonus* (Coleoptera, Chrysomelidae). Genetica 119: 193-199.

Poinar, G., P. Jolivet and A. Grafteaux. 2002. New food-plants provide clues for the origin and distribution of Timarcha (Col. Chrysomelidae Chrysomelinae). Lambillionea 102(1):103-109, 8 figs. in 3 pls.

Prathapan, K. D. and A. S. Konstantinov. 2003. The flea beetle genus *Apthona* Chevrolat (Coleoptera: Chrysomelidae) of southern India, with descriptions of seven new species. Proc. Entomol. Soc. Wash. 105(1): 154-179.

Rice, M. E. 2003. New host plant associations and destribution records for tortoise beetles (Coleoptera: Chrysomelidae: Cassidinae) from Southern Africa. Coleopts. Bull. 57(1):79-83.

Riley, E. G., S. M. Clark, and T. N. Seeno. 2003. Catalog of the leaf beetles of America North of Mexico. Coleopterists Society Special Publication No. 1, Sacramento, 290pp.

Świętojańska, J. 2004a. Description of last instar larva of *Aethiopocassis rhodesiana* (Spaeth, 1924) (Coleoptera: Chrysomelidae: Cassidinae). Annales Zoologici 54(2): 421-426, 36 figs. (1-4 in color).

Świętojańska, J. 2004b. Comparative description of first instar larvae of *Cassida stigmatica* Suffrian, 1844 and *Cassida rubiginosa* Müller, 1776 (Coleoptera: Chrysomelidae: Cassidinae). Annales Zoologici 54(2): 427-438, 59 figs.

Świętojańska, J. and H. V. Ghate. 2003. Description of first and last larval instar larva of *Craspedonta leayana* (Latreille, 1807) (Coleoptera, Chrysomelidae, Cassidinae). Annales Zoologici 53(4): 689-700.

Teixeira, E. P. and S. A. Casari. 2003. Descriptions and biological notes on immatures of *Microctenochira difficilis* (Coleoptera, Chrysomelidae, Hispinae, Cassidini). Iheringia 93: 23-30.

Verma, K. K. and P. Jolivet. 2002. Comments on Spilopyrinae (Col., Chrysomelidae). Nouv. Rev. Ent. (N. S.) 19(2): 99-110, 4 figs., 1 tab.

Wagner, T. and W. Freund. 2003. Revision of *Barombiella violacea* (Jacoby, 1894) (Coleoptera: Chrysomelidae, Galerucinae). Entomol. Zeit. 113(9): 258-262.

Warchałowski, A. 2003. The leaf-beetles of Europe and Mediterranean area. Natura Optima Dux Foundation, Warszawa, 600 pp.

Zúber, M. 2003. Faunistic records from the Czech Republic – 160. Klapalekiana 39: 68.

EntSoc of America
Cincinnati, 2003-
Salt Lake City, 2004,

Catherine N. Duckett (USA)

The 21st informal meeting of Chrysomelid workers was held in October 2003. This time it was organized by Alex Konstantinov and myself. In a change from previous meetings, one seminar was presented. The assembled company we heard Daniel J. Funk,Vanderbilt University, USA, present "*Neochlamisus*: Ecology and Evolution of the Cryptic case bearers." Dan (known as Dr. D. J. Funk to his friends!) discussed the taxonomic history biogeography and historical social impacts of *Neochlamisus* in this country before embarking on a detailed discussion of the *N. gibbosus* group and the origins of unisexuality. Dan asked for contributions of *Neochlamisus* from North America for his research on unisexuality.

After the talk there was discussion over refreshments and a reprint swap. Doug Futuyma contributed many reprints as did Dan. New faces included Amanda Evans who is studying *Leptinotarsa* under the guidance of Brian Farrell at Harvard University, and Kira Khaurova, Georgetown University, who has been working on Costa Rican chrysomelids under the guidance of Dave Furth, Smithsonian.

We hope to repeat both the refreshments and the reprint swap in Salt Lake City; please bring your reprints! We thank Alex and Kira for contributing for the refreshments. At the ESA 2004 meeting in Salt Lake City, Joe Gillespie will present on the phylogeny of the luperines. We hope to see you there.

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Evolution's Greatest Success:

The Evolutionary History of the Coleoptera Phytophaga

Phytophaga Synposium - ICE Brisbane 2004

Convenors, Rolf G. Oberprieler (Curculionoidea) and Catherine N. Duckett (Chrysomeloidea), are hosting the Phytophaga Symposium in the XXII International Congress in Entomology, Thursday 19 August 2004, Brisbane Australia. The symposium will be followed by an evening workshop in the same venue to further discuss ideas and questions arising from presentations. Below is the list of presentations and speakers.

1. Phylogeny of Chrysomelidae based on two molecular markers and morphological characters (Duckett, Gillespie, Reid, Duran & Kjer)
2. Review of morphological and molecular evidence on the phylogeny of Curculionoidea (Lyal, Marvaldi, Barclay, Anderson, Oberprieler & Vogler)
3. A preliminary phylogeny for the subfamily Chrysomelinae (Coleoptera: Chrysomelidae) (Reid & Grobbelaar)
4. An overview of the phylogeny of the brentoid complex (Coleoptera: Curculionoidea) (Alonso-Zarazaga, Jiménez, Sforzi, Wanat & Zardoya)
5. Phylogenetic and ecological diversification in the bruchine seed beetles (Coleoptera: Chrysomelidae) (Morse)
6. Phylogeny of the Oxycoryninae s. l. (Coleoptera Phytophaga) and evolution ofplant-weevil interactions (Marvaldi, Lyal, Oberprieler, Anderson & Bradbury)
7. Towards an evolutionary history of tortoise and leaf mining beetles: systematics, major events and diversity (Chrysomelidae: Cassidinae) (Chaboo)
8. Phylogeny and evolution of Brachycerinae s. l. (Coleoptera: Curculionoidea)(Oberprieler)
9. Contrasts in the host-plant and molecular phylogenetic relationships of cassidine and hispine beetles (Windsor, Duran, Keller, Gillespie, Vencl & Duckett)
10. Evolutionary trends in derelomine flower weevils: from associations to homology (Franz & Valente)
11. Phylogeny of Phytophaga (Marvaldi, Duckett, Lyal & Reid)
12. Evolutionary history of Phytophaga (Oberprieler, Duckett & Marvaldi)

Evening Workshop: Phylogeny and evolution of Coleoptera Phytophaga

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8. News, notes and general information of interest to chrysomelid colleagues (send electronically as a separate file, or as a separate sheet if possible).

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