METALEPTEA

THE NEWSLETTER OF THE ORTHOPTERISTS' SOCIETY

President's Message

Dear Society Members,

A NEW CALL FOR PROPOSALS TO THE ORTHOPTERISTS' SOCIETY RESEARCH FUND

I am very happy to announce that the 20th annual call for applications for the Orthopterists' Society grants primarily in support of graduate students and young professionals for significant basic research in Orthoptera (*s. l.*) and innovative presentation of findings is opened. Proposals are due on **1 July 2012** and **1 January 2013**. Please see instructions for submission of proposals herein and in our website (http://140.247.119.225/OrthSoc/).

MEMBERSHIP-PAYPAL-FACEBOOK

The membership is a major concern these days for any Society, but it is nice to see that the number of our Society is slowly increasing. We have 463 members. Unfortunately, not all are paying their dues timely. Please, those that are somewhat behind consider updating your dues. However, the good news is that since the instrumentation of payment through PayPal, payment is simpler for members as well as for our officers who deal with the Society's finances.

On a side note, we are now at 102 members on the Society Facebook page (http://www.facebook.com/groups/115824701779919/); most are members, not all. There is a marvelous range of photos that people are posting daily.

11TH INTERNATIONAL CONGRESS OF ORTHOPTEROLOGY:

I wish to remind you that the 11th International Congress of Orthopterology will be held next year (August 11-15, 2013) in Kunming, Yunnan, China, under the theme: "Orthoptera in Scientific Progress and Human Culture".

Orthopteran insects have influenced human life and human history for more than 3,000 years, as mentioned by the Chair of the Congress, Dr. Long Zhang in his welcome words (please see below). Orthoptera are fully integrated in human culture, thus for our next Congress we have chosen to look at Orthoptera from two perspectives: scientific progress and human culture.

Please visit the Website of the Congress for more information: (http://ico.greatlocust.com/).

JOURNAL OF ORTHOPTERA RESEARCH

Due to several understandable reasons and after a long period of deliberation, Glenn Morris decided to stop editing JOR. He has many other projects underway and planned, some involving insect research and teaching and some recreational. So, after more than a decade devoted to JOR, he wants to concentrate his efforts in these other projects. I thank him for his outstanding contribution to JOR and to science in general devoting his time in our wonderful Journal.

On the other hand, I am very glad to announce that the OS Executive Board has offered the office of Managing Editor JOR to Sam Heads (presently Associate Editor of JOR and Metaleptea) who has accepted this huge challenge. Besides, Corinna Bazelet (presently OS Regional Representative from Sub-Saharan Africa) has accepted to replace Sam Heads as Associate Editor of JOR. I thank Sam and Corey for accepting this challenge, crucial for our Society.

As there are many details behind the transfer of this key office of the Society, Glenn and Sam are working on them but it will take some time before the new Managing Editor is at office.

Sincerely,

Maria Marta Cigliano
La Plata, Argentina

An invitation to the 11th International Congress of Orthopterology

"Orthoptera in Scientific Progress and Human Culture"

Dear friends and colleagues:

Orthopteran insects have influenced human life and human history for more than 3,000 years and are fully integrated into human culture. For example, we not only study locusts to help control them and protect our food, we also play with crickets to find enjoyment. We listen to the sound of katydids to comfort our hearts. We make paintings and use all other arts to depict the beauty of orthopteran insects, from their attractive fusiform aspect and seemingly interminable jumping legs, to their diversity of colors and shapes. We Orthopterists express not only our science, but also our feelings through the colorful forms and biology of this precious group of insects.

Therefore, the chosen theme for this Congress is ***"Orthoptera in Scientific Progress and Human Culture".*** This Congress will provide the opportunity for researchers and scientists from throughout the world to get together to share their current research results in Orthoptera, exchange new ideas, techniques and establish networks to support future research in this field, as well as the study of cultural aspects of Orthoptera in different countries. On behalf of the local organizing committee, it is our pleasure to welcome you to the 11th International Congress of Orthopterology, in Kunming, China.

Gedansongzhan Temple, Shangelila, Yunnan

Kunming is a beautiful city, located in the center of the Yunnan-Guizhou Plateau, which has a long history. About 30,000 years ago, local inhabitants lived mainly around Dian Lake in Kunming. By about 286 BC, Kunming was a capital of southwest China. Besides many fascinating historical sightseeing options, this area has amazing natural beauty. Kunming is surrounded by lakes and hills, with many attractive destinations, such as Stone Forest, Gold Palace Park, Culture Exhibition Center, Dian Lake, Lijiang Ancient City, Shangelila (also known as Shangri-la), and Xishuangbanna (home to China's last remaining

herds of wild Asian elephants). Yunnan has plentiful biodiversity and beautiful landscapes, extending north near to Tibet, and south near Laos, Thailand, and Vietnam. The weather in the city is very comfortable. Because of its year-round temperate climate, it is called The Spring City. Let's meet together in August of 2013 and enjoy the excitement of advancing our science amidst the colorful life and culture of Kunming.

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The Orthopterists' Society Grant Solicitation and Winners of 2011 Winter Grant

Fellow Orthopterists,

We herewith announce the 20th annual call for applications for $300-$1,000 Orthopterists' Society grants primarily in support of graduate students and young professionals for significant basic research in Orthoptera (*s. l.*) and innovative presentation of findings. The Research Committee generally favors applicants without other funds, and encourages orthopterists from Asia, Latin America, and Africa to apply.

This research grants program is funded entirely by membership contributions, and is matched by an anonymous donor. I urge you to contribute in any amount with your dues and subscriptions.

This year grants will be awarded in September, and March, with due dates for applications on **1 July 2012 and 1 January 2013**. Proposals should be submitted to the Chair at the address below (Fax and E-mail applications [plain text only] are preferred). The proposals should be in the following format and restricted to the indicated number of pages: A) **DESCRIPTION** (one page): 1) TITLE, 2) SIGNIFICANCE, stressing the new aspects of the proposal, expected contribution to theory, relation to previous work, etc. (applicants should emphasize the nature and significance of their proposal to provide the judges with the basis for weighing different projects especially in fields outside their expertise), 3) RESEARCH PLAN, including the particular orthopterans to be studied, methods, logistics, an approximate timetable (to give the judges some idea of feasibility), etc., and, 4) INNOVATIONS IN PRESENTATION (if applicable), such as special tabulation, distinctive illustrations and diagrams, material on computer discs, CD-ROMs, etc. B) **CURRICULUM VITAE** (half page) including name, mailing, present position or years in graduate school, education, number of papers published or completed, citation of selected publications pertinent to the proposal to aid the judges; vital statistics are NOT desired. C) **BUDGET** (half page) including justification of items where appropriate (i. e. why special equipment is necessary unless self-obvious), other funding for the project, etc. Overhead CANNOT be provided on Society grants.

The Committee prefers proposals applicable to broad biological problems, even though the actual research may be narrower in scope. Proposals also should include clearly stated hypotheses and predictions, and evidence to be gathered to test the hypotheses and predictions. Taxonomic projects should also involve clear questions, hypotheses, and predicted evidence, and applicants for these projects must demonstrate some understanding of taxonomic theory and methodology, especially of the newer molecular techniques, and of cladistics, maximum likelihood, etc. Similarly, applicants for survey projects must clearly identify the biological problems to be solved. Projects which merely involve "finding out what is there" (important as that may be) will not be funded.

Proposals from graduate students must include a simple recommendation from their major professor or advisor. Those not affiliated with an educational or research institution should indicate where the work is to be done. A short report will be required from the successful applicants written for our newsletter, Metaleptea, for orthopterist but non-specialist readers.

This winter, the Research Grants Committee received twelve grant applications from five countries (United States, Colombia, Argentina, Germany, and New Zealand). The Committee, comprising Karim Vahed (UK), Theodore Cohn (USA), and David Hunter (Australia), funded 8 proposals. Advice on some projects was offered by committee members and consultants in keeping with the Society goal to encourage exchange of ideas and information. The following grants were made in amounts from US$ 400 to $1,000:

Cole, Jeffrey (USA) – Testing the ring species hypothesis in the katydid *Neduba* in the Sierra Nevada, California.

DiRienzo, Nicholas (USA) – Biogenic

amines and the regulation of personality in a field cricket.

Kensinger, Bart (USA) – Evolution of compound acoustical signals in the phaneropterine katydid *Dichopetala* in Texas.

Myers, Shelley (New Zealand) – Speciation through clasper divergence in the New Zealand stick insect *Clitarchus*.

Pocco, Martina Eugenia (Argentina) – Phylogeny of the Neotropical genus *Diponthus* and the evolution of gregariousness and aposematism displays.

Raszick, Tyler (USA) – Using RAD tag sequencing techniques to resolve a population-level phylogeny in *Schistocerca lineata* with different ecophenotypes.

Strauss, Johannes (Germany) – The complex tibial organ in non-hearing wetas (*Hemiandrus*, Anostostomatidae): neuroanatomy and vibration sensitivity.

Worthington, Amy (USA) – Do female field crickets mate multiply to acquire direct benefits from ejaculate?

Our Research Fund investments are still sufficient to fund only a few grants. I therefore appeal to the generosity of our members to contribute to the Fund so that we can continue awarding grants at high levels and need not disappoint applicants with worthy proposals. As a token of our appreciation, contributors to the Research Fund will receive a set of Carbonell notepaper with envelopes for contributions of $20-39, the 1993 JOR colored plate for $40-99, and a Carbonell original for $100. (Please remind me if I have been remiss in sending these to past donors.) Through contributions and matching funds from an anonymous contributor, we hope to support this year's applicants and have some left over to build up this fund as an endowment to support future research projects.

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The Orthopterists' Society Grant Reports

Phylogenetic analyses of the band-winged grasshoppers (Acrididae: Oedipodinae) reveal convergence of wing morphology and incongruence with current taxonomy

Many groups of organisms have wide distributions spreading across several continents. Often these taxa occur in similar habitats and share a common morphology. These phenotypic similarities can be the result of either common ancestry or convergent evolution in response to similar selective pressures (Fig. 1). Traditionally taxa with similar morphological characters have been grouped into higher taxonomic units ignoring the possibility of convergent evolution due to similar ecological pressures. However, molecular methods can test these taxonomic relationships overcoming the problem of convergence.

Oedipodinae, or band-winged grasshoppers, are found on almost all continents and share common phenotypes across their distributional range (Fig. 2). Within the band-winged grasshoppers, several characteristic phenotypes are found

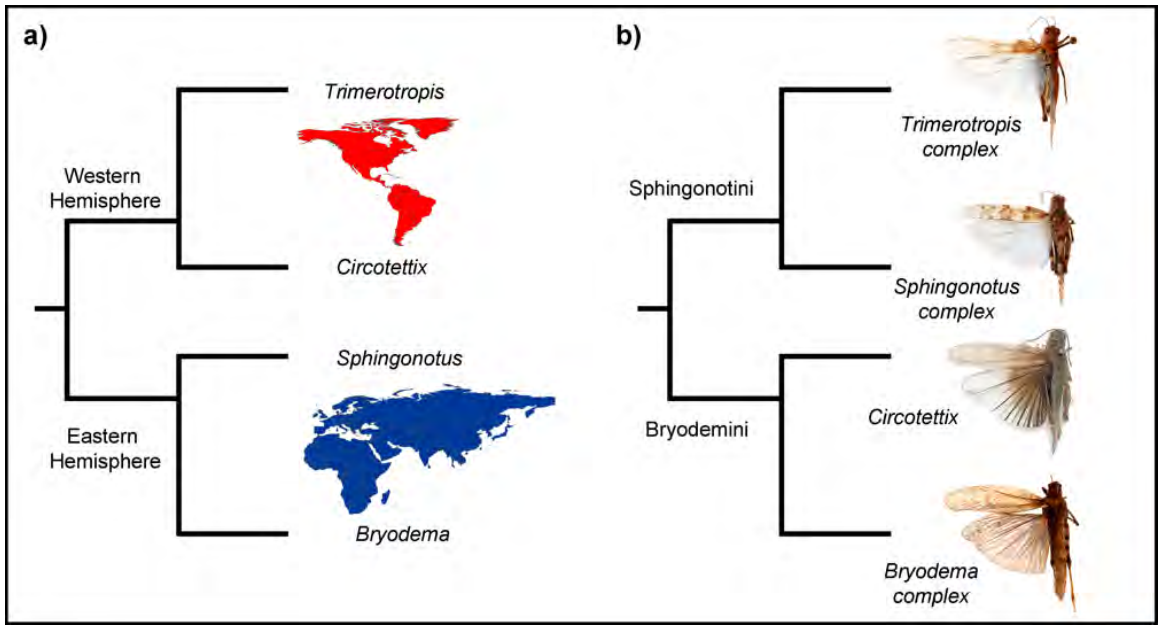

Figure 1. *The two competing hypotheses of a) convergent evolution and b) common ancestry.*

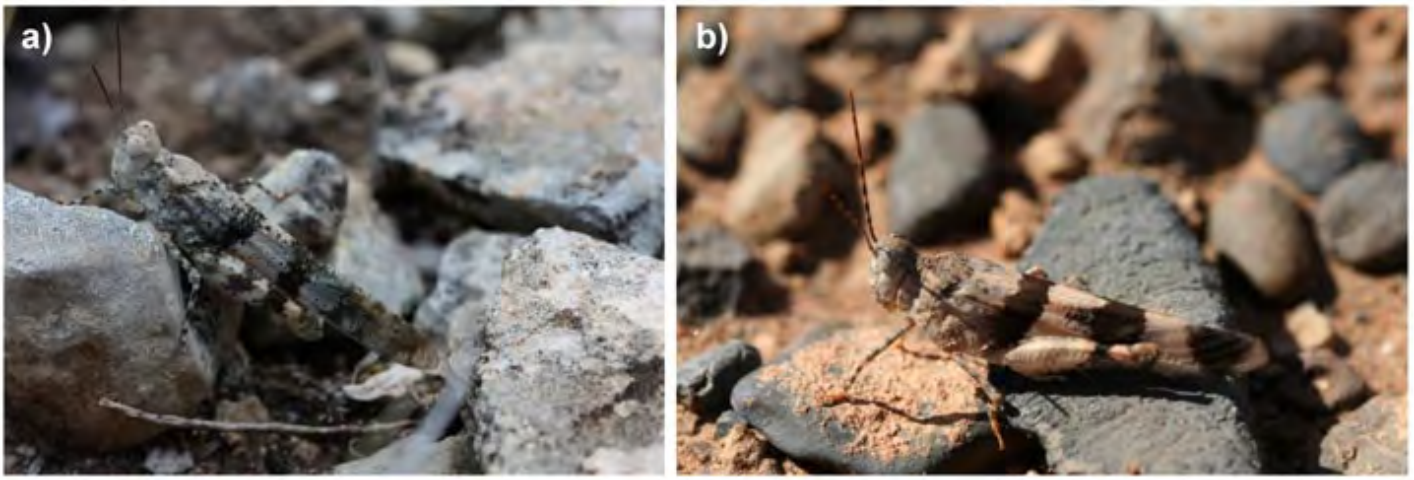

Figure 2. *a) Trimerotropis saxatilis from Texas, b) Sphingonotus octofasciatus from Morocco*

in the Palaeartic as well as in the Nearctic. In our study we aimed to distinguish among two distinct hypotheses explaining the observed distributions and phenotypic similarities between Palaearctic and Nearctic Bryodemini and Sphingonotini (Fig. 1). Members of both tribes are found in both the western and eastern hemispheres. They were assigned to their respective tribes mainly based on the shape of their fore- and hind wings. We sequenced parts of the mitochondrial COI and ND5 genes and the nuclear ITS2, H3 and 18S genes of several species of each group in order to evaluate the two alternatives of common ancestry or convergent evolution. We used standard Bayesian and likelihood methods to reconstruct the phylogeny and used Bayes Factors analysis to evaluate competing hypotheses. A molecular clock analysis was performed to obtain divergence time estimates for major lineages (Husemann et al. in press).

Our analyses revealed inconsistencies with the current taxonomy (Husemann et al. in press). Neither Sphingonotini nor Bryodemini are monophyletic. Instead, the Nearctic and the Palaearctic taxa formed monophyletic clades. Palaearctic taxa belong to two distinct lineages in accordance with the designation of Bryodemini and Sphingonotini. In addition we found two sublineages in the Nearctic, corresponding to White's chromosomal groups A and B (White 1948, 1950, 1973). Within the Palaeartic Sphingonotini, two previously identified groups, the *Sphingonotus caerulans* group and the *S. azurescens* group, were supported (Hochkirch & Husemann 2008, Husemann et al. 2011). Several genera do not represent monophyletic groups and the entire complex requires revision.

We used a molecular clock approach to estimate the time when Neartic and Palaearctic lineages split. The split was dated at around 35 million years ago. This suggests that the divergence is not the result of an ancient vicariance event (break-up of Pangaea), but rather the result of a single invasion. Given the time estimate the migration most likely occurred via the Beringian land-bridge. The direction could not be convincingly inferred, but a different study suggests that the origin of oedipodines is in the eastern hemisphere (Chapco & Contreras 2011).

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Georges Claraz – a Swiss naturalist in Argentina

The naturalist Georges Claraz (1832–1930) was one of the pioneers of the exploration of Patagonia and the study of its people. Although well-known at the time, his work has largely been forgotten but his name lives on in the species of Orthoptera dedicated to him by Henri de Saussure and Alphonse Pictet.

Georges (or Jorge) Claraz was born in Fribourg, Switzerland, in 1832. The eldest of eleven children, he studied natural sciences at the universities of Zürich, Freiburg im Breisgau (Germany) and Berlin. In 1857 he went to Brazil as assistant to Jakob Christian Heusser (1826–1909), his former teacher of mineralogy, who had been asked by the Swiss authorities to investigate the condition of certain Swiss settlers who had complained about unfair treatment. While travelling, they took the opportunity to study the natural history of the places they visited as well as writing reports for the Swiss authorities (Hux, 1975).

Claraz' criticism of the Brazilian government's treatment of slaves made them *personae non gratae*, and in 1859 they moved to Argentina and bought land near Bahia Blanca (Buenos Aires State). They were later joined by Antoine Claraz, Georges' younger brother. There they raised cattle, sheep and horses, and continued their natural history studies. Claraz soon came into contact with the Mapuche and Tehuelche peoples, learning something of their language and culture (Kradolfer, 2003). Heusser and Claraz published a number of scientific papers and newspaper articles based on their observations and experiences (see Claraz, 1927 and Schinz, 1931).

In 1865–1866 Claraz made a pioneering expedition into northern Patagonia, between the Rio Negro and Rio Chubut, keeping a careful diary and collecting natural history and ethnographic material. Although the expedition diary was not published at the time, two versions have since been published with commentaries by Casimaquela (1988, 2008); the latter also includes Spanish translations of some other unpublished notes, information about the plants and vertebrates mentioned and some lexicographic information on the native languages Claraz studied. Claraz contributed material for several dictionaries of native languages published by other workers, and left many unpublished letters and notes (Hux, 1975).

Although Patagonia was brought to European attention by the publication of accounts of the first recorded circumnavigation of the earth by Ferdinand Magellan and Juan Sebastián Elcano (1519–1522), it remained relatively unknown, home to various native peoples and settlers of diverse origins and not part of any recognised state (despite the attempt by Orélie-Antoine de Tounens to create the Kingdom of Araucania and Patagonia for himself). It was not formally divided between Argentina and Chile until 1881. Claraz' expedition was the first to examine the natural history of the region in which he travelled, and he recorded a lot of valuable information about the native cultures before the "Conquest of the Desert" in which the Argentine government took control of northern Patagonia in the 1870s and 1880s with a devastating impact on the indigenous people.

Although not in the same category as Darwin, Humboldt or d'Orbigny, Claraz deserves wider recognition because his interests were broad and his observations acute. Moreover, he shared his knowledge in a

(left) Syntype of Diponthus clarazianus Pictet & Saussure, (right) Syntypes of Alcamenes clarazianus Pictet & Saussure

wide correspondence with European and American specialists (Kradolfer, 2003) and collected an imposing body of material, sending many specimens to museums in Switzerland and Britain (Hux, 1975). These specimens were mainly from the area around Bahia Blanca and the Swiss settlement of San José (Entre Rios State), but some were collected during his Patagonia expedition or (in the case of some ethnographic and fossil material) procured from elsewhere.

One of Claraz' correspondents was Henri de Saussure, a prolific Genevan biologist specialising in the orthopteroid insects, who had a special interest in the American fauna having travelled widely in Mexico and the United States himself. Saussure described many species on the basis of specimens sent to him by Claraz, and named several in dedication. The grasshopper genus *Clarazella* Pictet & Saussure, 1887 was erected for *C. patagona* Pictet & Saussure, 1887, the type specimen having been collected during Claraz' Patagonia expedition. The other Orthoptera named after Claraz are *Alcamenes clarazianus* Pictet & Saussure, 1887, *Bufonacris claraziana* (Saussure, 1884), *Diponthus clarazianus* Pictet & Saussure, 1887, *Neocurtilla claraziana* (Saussure, 1874) and *Gryllodes clarazianus* (Saussure, 1874) (a junior synonym of *Anurogryllus muticus muticus* (De Geer, 1773)). In the Mantodea there is *Coptopteryx claraziana* Saussure, 1869, in the Blattodea *Blabera claraziana* Saussure, 1864 (a junior synonym of *Blaptica dubia* (Serville, 1838)) and in the Phasmida *Agathemera claraziana* (Saussure, 1868). Primary type material of all of these species is preserved in the Museum d'histoire naturelle in Geneva.

Other dedications include the wasp *Odyneurus clarazianus* Saussure, 1870 and the millipede *Odontotropis clarazianus* (Humbert & Saussure, 1869), as well as a number of plants (listed by Kradolfer, 2003).

In 1882 Claraz returned to Switzerland, where he remained in order to take care of his widowed mother. Heusser stayed in Argentina until his death in 1909 (Claraz, 1927). In 1896 Claraz retired to Lugano in the canton of Ticino, where he was visited by the famous Argentine explorers Francisco Moreno and Carlos Moyano. He died in 1930, leaving some of his money to fund travel and publication by natural scientists. The "Kuratorium der Georges und Antoine Claraz-Schenkung" (currently administered by the Swiss Academy of Sciences) also holds many of his personal papers. His memory is honoured in Argentina where a village in Buenos Aires State was named after him.

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A brief search for the Texas Cholla Grasshopper, *Chloroplus cactocaetes* Hebard, 1918 (Acrididae: Melanoplinae), with illustrations of the species and its habitat

Chloroplus is a distinctive monotypic genus in the subfamily Melanoplinae. Its sole representative, *Chloroplus cactocaetes* Hebard, 1918, associates with several species of cholla cactus (Cactaceae: *Cylindropuntia*), characterized by their cylindrical stems. *Chloroplus* has been collected at locations from southeastern coastal Texas to the Trans-Pecos of West Texas and north at least to Bexar and Uvalde counties (Hebard 1918, pers comm. J. Stidham 2010 and J. D. Weintraub 2010). During the mid-1930s, H.R. Roberts collected it in Nuevo Leon and Coahuila, Mexico (pers comm. J.D. Weintraub 2010) but it is not included in a recent list of Mexican Orthoptera (Fontana et al., 2008), and there do not appear to be specimens in the collection of the Instituto de Biología, Universidad Nacional Autónoma de México in Mexico City (pers comm. Enrique González Soriano).

Although mentioned in brief summaries (e.g., Helfer 1987, Eades et al. 2010, Ferguson 2010), and checklists (Yin et al. 1996, Stidham and Stidham 2001), little has been published concerning the biology or distribution of *C. cactocaetes* since its original description. White (1945) presented the shapes of its chromosomes and Hebard (1918) figured the cercus of the type specimen. Despite Hebard (1918, p. 146) describing it as "...one of the most delicately colored and beautiful of the North American Melanopli", it has not been illustrated in printed literature or on the Internet.

Figures 1-2. *Chloroplus cactocaetes habitat*

In his description of *C. cactocaetes*, Hebard did not specify which *Cylindropuntia* hosted it; neither did he indicate whether coastal and inland populations inhabited the same species of cactus. I believe only one kind of cholla cactus is native to the saline flats near Corpus Christi, Nueces County, Texas, where Hebard found *Chloroplus* in greatest numbers—the Pencil Cactus, Desert Christmas Cactus, or Tasajillo, *Cylindropuntia leptocaulis* (DC.) F.M. Knuth. This is a widespread species (Texas, Oklahoma, New Mexico, Arizona, and northern Mexico) with a bushy growth form and delicate stems the diameter of a pencil. It inhabits a variety of soil types that are often sandy or gravelly. Pencil Cactus is frequently found growing below larger plants which it uses for support and Stidham (pers comm. 2010) stated that this grasshopper prefers sites where the cactus is shaded among trees.

Grasshoppers that associate with specific plants have an unusual appeal. The presence of a cactus-obligate where I would soon be traveling dictated that I make some effort to find it. So, with the idea of photographing *Chloroplus* while working in Texas, I contacted Jimmy Jackson of Beeville, Texas. Jimmy is a birder and naturalist who lives near Corpus Christi, and I asked him about possible locations of Pencil Cactus in his area. Jimmy's friend Linda Alley, a photographer from the Corpus Christi area suggested a small road nearby in Jim Wells County.

Armed with Jimmy's hand-drawn map, on the chilly morning of 5 November 2010, I visited the site, a quiet lane through farmland with scattered oaks. I didn't have a lot of time, as I was expected several

Figure 3. *Chloroplus cactocaetes male.*

hours further south that afternoon. I examined at least 100 m of open fence row with rather sandy soil that supported a growth of Pencil Cactus (Figs. 1 and 2). Three *C. cactocaetes* (two males and a female) were encountered—two on cactus and one on grasses (the latter jumped to a nearby cactus). Although Hebard described *Chloroplus* as being extremely alert with unusual leaping powers and being quick to hide, I was able to take all three individuals by hand, an exercise that required some finesse. I suspect that the cooler temperature and perhaps the lateness of the season made them easier to catch (as well as the female missing one hind leg). Also present along the fence row and often hidden in taller grass were hundreds of mounds of the stinging red imported fire ant (RIFA) (*Solenopsis invicta*)—which presented a significantly greater threat than a few cactus spines.

Figure 4. *Chloroplus cactocaetes male cercus*

A green grasshopper, *Chloroplus* is cryptic as it sits on similarly hued stems of cholla cactus (Fig. 3). Although attractively colored, I found its most striking feature to be its head, which Hebard called "disproportionally large" and mentioned as one of the characteristics that separate it from members of the superficially similar genus *Camplyacantha*. I found myself focusing as well on the very large eyes and red antennae. Also noteworthy are the hind femora which are short and broad-based (like a pork chop), and colored in pale brown, gray, and red with transverse darker bands on the dorsal surface and inner face. The hind tarsi are a beautiful deep blue-green. The cerci are illustrated in Fig. 4.

Although I only had about an hour-and-a-half to spend in search of *Chloroplus*, my visit was successful in every way. During my next trip, I hope to examine additional sites for the cactus and its grasshopper.

Thanks to Brian Loflin (Austin, Texas) for comments on cactus taxonomy, Jimmy Jackson (Beeville, Texas) for his information and warm hospitality, Linda Alley (Corpus Christi) for suggesting the field site, John Abbott (University of Texas, Austin), and Enrique González Soriano (Instituto de Biología, Universidad Nacional Autónoma de México, Mexico City) for checking specimen records, and to John Stidham (Garland, Texas) and Jason D. Weintraub (Academy of Natural Sciences, Philadelphia) for information on specimens and locations pertaining to *C. cactocaetes*.

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Introduction of migratory locust studies in China

There are three migratory locust subspecies in China, including *Locusta migratoria manilensis* (Meyen), *Locusta migratoria migratoria* (L.), *Locusta migratoria tibetensis* (Chen), which are important pests of agriculture and husbandry. The scientific departments which are studying the migratory locust in China are as follow: (1) the Chinese Academy of Sciences (CAS), studying behavior phase changes of the migratory locust and plague mechanism; (2) the Institute of Plant Protection, Chinese Academy of Agricultural Sciences (IPPCAAS), working on migratory locust management; and (3) the China Agricultural University (CAU), with a research focus on chemoperception. I study the adaptation of locusts to temperature changes at IPPCAAS under the direction of my advisor Professor Zhang Zehua.

We reared Oriental Migratory Locusts, *Locusta migratoria manilensis* (Meyen) from 3rd instar until adult death at five constant temperatures (18, 21, 24, 27 and 30°C) in the laboratory, and recorded life history variables. Overall, temperature strongly influenced growth, development, and behavior. Growth and development rates were both positive, linear functions of temperature, with low thermal thresholds for nymphal growth at 15°C and growth at 13°C. There was no mating at 18°C and no oviposition at 21°C and below. Rearing temperature did not significantly influence mass at adult molt, except for the 18oC nymphs who molted to adults with significantly smaller mass. Females laid their first egg pod significantly later at 24°C than at 30°C females. There were strong, but non-significant trends for low-temperature females to die earlier, and lay fewer and lighter egg pods; 24°C females averaged less than half the dry lifetime egg mass of 30°C females.

Our results show that temperature may be an important factor affecting the occurrence and distribution of migratory locusts. However, there are four questions that have yet to be answered: (1) How does temperature affect the distribution of the migratory locust? (2) What is the relationship between temperature changes and the occurrences of the migratory locust or which developmental stage of locust will be influenced most significantly by accumulated temperatures? (3) What, if any are the projected changes in migratory locust distribution and potential for outbreaks given future climate changes? (4) What are the mechanisms controlling diapause in the migratory locust and why do northern populations diapause? Clearly, further studies are needed in order to answer these questions.

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On Some Grasshopper Names and Other Things too

For the last forty years or so, I have been making and updating a list of the publications that contain information on the acridoid fauna of the Neotropical Region. A proportion of these papers have information which is essential for the taxonomy and nomenclature of these insects. Others register geographical distribution, bionomics and the like. I have not listed papers that refer only to the control of those species that are considered agricultural pests. Also I have been making and updating a list of Neotropical acridoid species. All the data in the text that follows were registered in July 2008 (except hose related to Amédégnato, who died recently). Some certainly have changed at present.

In my list of species, I have registered these that have been found within the Neotropical region (from the lowlands of Mexico to Patagonia). But I have listed also a few species of evident Neotropical origin that have invaded the Nearctic region, such as the few romaleid grasshoppers now living in the US and even in Canada. Also, all the Eumastacidae, the Pyrgomorphidae and the Cyrtacanthacridine acridids found in the Americas are included. So too are the Xyronotidae and Tanaoceridae, of doubtful origin and relationships but living mostly about the limit of the Neotropical-Nearctic regions.

It is evident that both these lists are incomplete, and contain errors. As to the publications, papers may have escaped my attention. Others are being issued while I am finishing my updates. With the species, the situation is even worse. New species are being continuously described and published and for the Neotropical region, it seems evident that the acridoid fauna is much larger than the small portion of it that has been described and published to date.

In the course of this work, some data which are just curious, related to the names of these insects, to the authors of these names and to some particularities of the publications, have attracted my attention. Here are some that I think might be of interest.

Number of publications related to the subject (2008) ..... 1239. Of these publications, the ones of taxonomic importance..... 589.

By "of taxonomic importance" I mean those that have descriptions of new species, new combinations, new synonymies, designation of lectotypes or neotypes and the like. Other publications may have data on geographical distributions, bionomics, food-plants and the like. They may also be important, but not for taxonomy and nomenclature. The publications of taxonomic importance were, when I made the survey, roughly 50 % of all the published papers.

Names of genera: number of letters

The shortest ones have only four letters, There are only two of them:

Bora Amédégnato & Descamps 1979 (Romaleidae, Bactrophorinae)

Tela Hebard 1932 (Acrididae, Proctolabinae)

Bora is the name of an Amerindian nation in the region where the insects were found, in northeastern Peru (Amédégnato, pers. com.)
Tela is a geographic name, in Honduras, as Hebard himself says in his paper. Fortunately both the above four-letter-words are quite decent.

There are even shorter generic names in the neotropical insects. I remember one with only three letters: the genus ***Itu*** (Coleoptera, Torrindicolidae). I have not seen any with only two letters, but maybe there is such. There is certainly one among the plants: a genus of neotropical orchids is called ***Aa***.

The type species of the genus ***Itu*** is ***Itu zeus***. ***Itu*** is the name a town in the Brazilian State of Sao Paulo. Its inhabitants have the reputation of being greatly exaggerated in what regards the size of things, natural or manufactured, in their native town. So much that, with regard to some thing which is unusually large, people say "this must come from Itu". As to the specific name Zeus, he was the chief god of the ancient Greeks, the ruler of all things. The Romans called him Jupiter. And the largest planet of the solar system is named after him. When I first heard the name of that beetle, I imagined that it must be a very large one. Something like an African *Goliathus*, or one of the very large Amazonian cerambycids. A friend who knows about Coleoptera told me that the individuals of this species are scarcely visible to the naked eye.

Coming now to the size of the grasshopper names, here are a few examples of them.

The longest Acridoid generic name (unique) has 21 letters:

Scopaeoscleratoscopia Jago 1989 (Proscopiidae)

The second longest (also unique) has 18 letters:

Leptomerinthoprora Rehn 1905 (Acrididae, Ommatolampinae)

There are several with 16 letters,

such as the following and others:

Apoxycephalacris Amédégnato & Descamps 1973 (Acrididae, Ommatolampinae)

Pareucephalacris Descamps 1976 (Acrididae, Proctolabinae)

Pseudeumastacops Descamps 1974 (Eumastacidae)

The rest of the generic names have all between 5 and 15 letters.

As to the ending of the generic names, the most common is ***acris***. There are 172 valid generic names ending in ***–acris***. This ending may be found elsewhere among neotropical insects. I remember ***Eburodacris*** (Coleoptera, Cerambycidae). **Acris** (according to Brown's 1956, Composition of Scientific Words) is a Greek word meaning "locust or grasshopper". The second is ***–tettix*** with 31 valid generic names. **Tettix**, on the same authority as above, is also Greek and means "cicada". Cicada seems wrong for a grasshopper. But if one looks for **cicada** in Brown's book, it is a Latin word that means "tree cricket" or "locust".

As to the size of the individuals of the grasshopper species, the Neotropical Region harbors what are probably the largest and the smallest of known grasshoppers, The largest belong in the genus ***Tropidacris***. Females of ***T. cristata*** may reach a length of 12 centimeters. And the smallest males of ***Illapelia penai*** are about 5 mm in body length.

The authors and their publications.

With reference only to the authors who are now not living, these are the number of publications with data on neotropical acridoids in my records. Only the publications of which the named is the sole author or the first author are here listed. Authors with more than 10 publications are:

Amédégnato 125, Liebermann 115, Rehn 77, Descamps 47, Ronderos 45, Kevan 37, Mesa 35, Hebard 22, Piza 22, Bruner 17, Scudder 16, Uvarov 16, Dirsh 12,

The number of publications does not mean much. A monograph with 200 pages is ***one publication***, and so is another of 1 page. Its length either, may be unimportant. More useful information can be found sometimes in a paper of 1 or 2 pages than in another of 20. Of the above publications, some have information that is essential for the taxonomy and nomenclature. Others have only data on such subjects as bionomics, geographical distribution, economical importance and the like. For instances, of the 115 publications of Liebermann, only about 40 have real taxonomic importance. Of the 22 papers of Piza practically none has any taxonomic importance, while of 22 papers by Hebard, 18 have taxonomic importance, and so have almost all of the 125 papers by Amédégnato. Amédégnato has probably an equal or larger number of papers of wich she is the second author.

Numbers of genera and species of Neotropical Acridoidea (2008).

Valid species…….…….. 2184
Valid genera ……..…….…... 525
Mean number of species by genus ……..... 4.2

Counting the genera and species in the different taxonomic groups:
Families.
Eumastacidae: Genera: 40. Species: 213. Species by genus: 5.3
Proscopiidae: Genera: 21. Species: 179. Species by genus: 8.5
Xyronotidae: Genera: 2. Species: 4. Species by genus: 2.0
Tanaoceridae: Genera 2. Species: 4. Species by genus: 2.0
Tristiridae: Genera: 18. Species: 25. Species by genus: 1.4
Pyrgomorphidae: Genera: 16. Species: 30. Species by genus: 1.9
Ommexechidae: Genera: 12. Species: 32. Species by genus: 2.7
Romaleidae: Genera: 106. Species: 493. Species by genus: 4.7
Pauliniidae: Genus: 1. Species: 1. Species by genus: 1.0
Acrididae: Genera: 307. Species: 1203. Species by genus: 3.9

Subfamilies of Acrididae.
Melanoplinae: Genera: 44. Species: 251. Species by genus: 5.7
Marellinae: Genus: 1. Species: 1. Species by genus: 1.0
Proctolabinae: Genera: 29. Species: 199. Species by genus: 6.9
Copiocerinae. Genera: 26. Species: 81. Species by genus: 3.1
Leptysminae: Genera: 20. Species: 92. Species by genus: 4.6
Rhytidochrotinae: Genera: 22. Species: 50. Species by genus: 2.3
Ommatolampinae: Genera. 108. Species: 290. Species by genus: 2.3
Cyrtacanthacridinae: Genera: 3. Species: 55. Species by genus: 18.0
Acridinae: Genera: 11. Species: 28. Species by genus: 2.5
Oedipodinae: Genera: 11. Species: 27. Species by genus: 2.5
Gomphocerinae: Genera: 32. Species: 129. Species by genus: 4.0

I do not know whether any part of the above information will be useful to anybody, but one never quite knows the value of the data published. Somebody might, in the near or distant future, find some use for data in this note.

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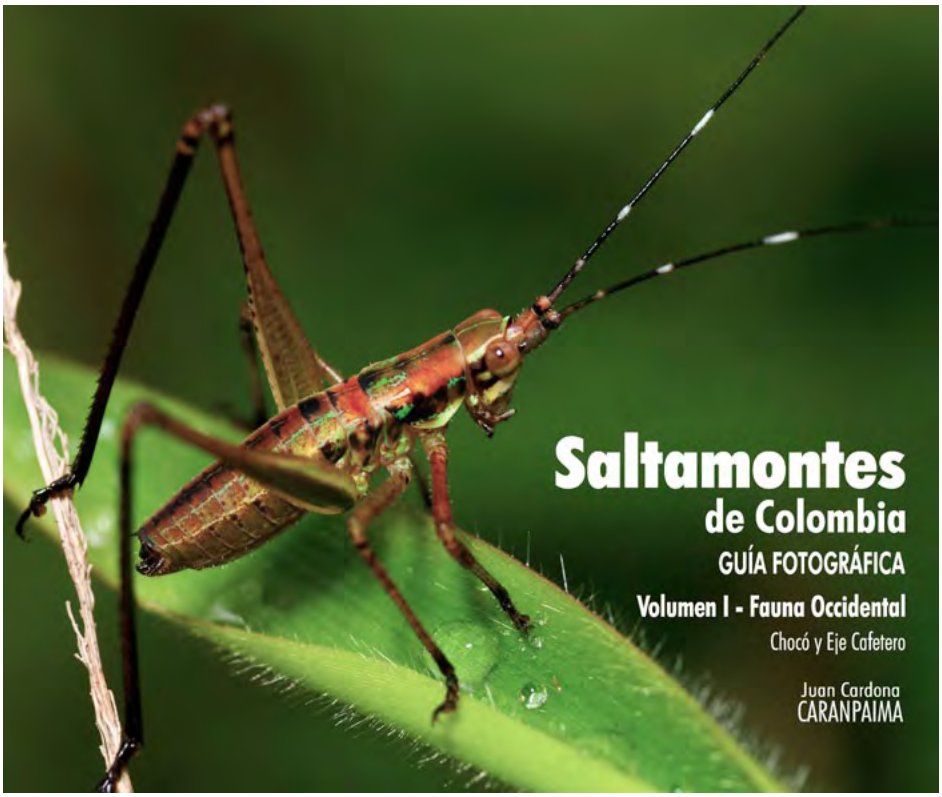
Book Review: *Grasshoppers of Northwest South America: a Photo Guide* Volume 1 – The Western Fauna (North Chocó, Central and Western Cordillera)

Juan Cardona, published by Blurb.com (2012), 124 pp., $59.54 US
English Edition: ISBN 978–95846042–4
http://www.blurb.com/bookstore/detail/3236908



Juan Manuel Cardona, a forest engineer and avid wildlife photographer from Colombia, has a passion for Neotropical orthopterans and nowhere is this more evident than in the pages of his new photo guide to the grasshoppers of northwestern South America. This lavishly illustrated 124 page volume is the first of a planned trilogy that will document orthopteran diversity in Colombia and the surrounding regions using Cardona's breathtaking photographs. Dedicated to his wife Malena, who "patiently suffers [his] hopper-mania", the book is a tour de force of orthopteran macrophotography and includes no fewer than 140 beautiful full-color images that adorn each glossy 8×10 inch page. Even more remarkable is that every image in the book was captured in the field and thus reflect their glorious saltatorial subjects in their natural surroundings. The volume is more than just a collection of stunning photographs however, as it includes a brief introduction to each of the taxa covered along with notes on their identification and biology, as well as a map and list of localities, and a useful taxonomic index. The book is also available in Spanish and a Japanese edition will be published this October.


Grasshoppers belonging to the subfamily Rhytidochrotinae are unusual and different from the typical grasshoppers in many things: for one, many of them lack a tympanum (in those grasshoppers which do have a tympanus, the tympanus can be just above where the leg meets the abdomen, as in this male of *Opsion varicolor* from Mistrató, Risaralda), and almost none of the species has wings even when adult, sometimes not even a trace of them. They also often have some striking colors, like blue, green, orange or red (or black, as the one in the opposite page). Genera are very similar, sometimes polymorphic and changing in color even within the same species, and for telling the genera apart, features (other than examining the genitalia) such as the presence or absence of tympani, length and shape of the antennae and the texture and shape of the chevrons, thorns and spikes in the hind legs, are used.

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Undoubtedly a valuable addition to the library of anyone interested in Neotropical Orthoptera, the book will also appeal to students, naturalists visiting the region, wildlife photographers and of course, anyone afflicted with the same "hopper-mania" as its author; a category into which I suspect most, if not all of the Society membership will fall.

Sam W. Heads
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Orthopteran research featured in the cover of PNAS

Congratulations to Natasha Mhatrea, Fernando Montealegre-Z, Rohini Balakrishnan, and Daniel Robert for publishing a very interesting study titled "Changing resonator geometry to boost sound power decouples size and song frequency in a small insect" in the prestigious *Proceedings of the National Academy of Sciences of the U.S.A.* as a cover article (doi: 10.1073/pnas.1200192109).

Here is what *PNAS* says about the cover image: Pictured is a singing Indian tree cricket (*Oecanthus henryi*). Most male crickets rub their wings together to produce mating songs at a single sharply tuned frequency that is largely determined by body size. The songs of *O. henryi*, however, vary in frequency. Natasha Mhatre et al. reveal the biomechanics of the tiny tree crickets' high-amplitude songs and find that the distinct geometry of their forewings plays a key role in frequency variation. The findings negate the idea that male crickets are obliged to signal their actual body size as a result of their inflexible sound production mechanisms.

Editorial

It is hard to believe that we are already half way through the year 2012. For me personally, all my time has been spent on typical things that anyone in academia has to deal with, such as teaching, writing grant proposals (lots of them!), advising students, etc. Now summer is here, and I would like to go out and collect some grasshoppers, but unfortunately I find myself stuck in my office in front of my computer all the time. Well, some day soon, I will get a chance to be in the field again.

This issue is being published a few weeks later than planned because there are some important changes made in the Society which we want to be reflected in *Metaleptea*. However, the goal of publishing at least three issues per year regularly is still being met, thanks to all contributing members as well as my associate editor Sam Heads who provides excellent editorial support in a timely manner.

I have heard from many members who want to contribute to *Metaleptea*. And I am sure there are many more because I can see the flurry of activities in our Facebook page. To be published in *Metaleptea*, please send me any articles, photographs or anything related to Orthoptera at song@ucf.edu with a subject line starting with [Metaleptea]. MS Word document is preferred and images should be in JPEG or TIFF format with a resolution of at least 144 DPI. Please do not embed images into a word document, but send me as separate files. The next issue of *Metaleptea* will be in September 2012 and please send me the articles promptly. Also, please do not hesitate to send me feedback regarding *Metaleptea*. I look forward to hearing from you soon.

HOJUN SONG
Editor

Officers of the Orthopterists' Society