

METALEPTEA

THE NEWSLETTER OF THE



ORTHOPTERISTS' SOCIETY

President's Message

By **MICHAEL SAMWAYS**
President

Orthoptera are among the most fascinating of all insects, and so it is not surprising that we have a society dedicated to them. While they include the good, the bad and the ugly, they also include the beautiful. Among their good attributes is the fact that they can be important components of food webs in terrestrial ecosystems. Through frass deposition as well as through their cadavers upon death, Orthoptera species are important recyclers of nutrients and this deposition can sometimes be substantial. The brown locust of southern Africa, for example, was estimated in 1984/5 to have deposited 2.26 million tonnes of frass, representing 14,700 tonnes of nitrogen. Interestingly, had this nitrogen been tied up in sheep faeces, it would not have been nearly so readily available to plants as through locust frass because the sheep faeces simply dry out on the land surface.

Intriguingly, each land mass has its one or, at most, a few, species that swarm to become outbreak species, impacting on agriculture... why not more species? The Guinness Book of Records lists the Rocky Mountain locust (*Melanoplus spretus*) as the greatest concentration of any animal when it passed over Nebraska in the U.S.A. on 15-25 August 1875 with a swarm estimated to cover 514,374 km² and containing 12.5 trillion individuals weighing a total of 25 million tonnes. Saliently, for the current biodiversity crisis, this species was



extinct by the early 1900s.

Among the Orthoptera are some of the most fascinating of all insects. Do have a look at the superb picture of the stunning *Lichenenodraculus matti*, photographed by Luis Salagaje, on the front cover of the latest *Journal of Orthoptera Research* (Vol. 22[2]). Crypsis can indeed be beautiful! Perhaps not so cryptic is the amazing purple, pink, yellow, black and green *Pardalota reimeri* photographed by the Orthopterist Society's webmaster and master photographer Piotr Naskrecki in Mozambique. Piotr has described this species as the 'Holy Grail for katydid aficionados', having not been seen (until now) since it was described in 1911. Do also have a look at Piotr's TheSmallerMajority blog (<http://thesmallermajority.com/2014/02/18/mozambique-diary-pardalota/>) for more!

This is the advantage of being a member of the Orthopterists' Society - it keeps you in touch with a whole world hidden in plain view...

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The 2014 Theodore J. Cohn Research Grants Funded

By **MICHEL LECOQ**

Chair, Theodore J. Cohn Research Fund Committee

This year the Committee received 15 grant applications originating from eight countries (Algeria, Argentina, Australia, Bolivia, China, France, Germany, United States). A lot of fascinating proposals were sent in covering a good range of topics from faunistic and systematic to ecology, ethology, and physiology. Many groups of orthopteroids were represented: Mantidae, Acrididae, Gryllidae, Pamphagidae, Romaleidae, etc. Projects were submitted by undergraduate or graduate students as well as from a young postdoc and it was not easy to select the projects to be funded. After a very careful examination, the Committee, comprised of David Hunter (Australia), Battal Ciplak (Turkey), and myself, finally decided to approve 6 proposals.

The following grants (in alphabetical order) were made in amounts from USD \$700 to \$1,000 (for a total of USD \$5,733):

- **Marianna Anichini** (Germany) - To be "Pavarotti" in a crowded concert hall? Song competition between bush cricket males in natural choruses.
- **Tom Chen** (USA) - Sex or Death: Behavioral syndrome of a field cricket (*Gryllus* sp.) as a function for parasitoid avoidance.
- **Morgan DePerno** (USA) - Vibrational communication in the Mahoenui giant weta (*Deinacrida mahoenui*).
- **Kristopher Keane** (USA) - Raw materials of sexual selection: Signal variation in a rare, lekking cricket.
- **Ricardo Mariño-Pérez** (USA) - On the origin of the New World Pyrgomorphidae.

- **Elizabeth Swanger** (USA) - The role of juvenile hormone in female responses to male sexual signals.

Congratulations to all the successful applicants, and on behalf of the Committee, our best wishes for the full success of their work. They will, of course, have to present a short report on their results for our newsletter *Metaleptea*.

For candidates who have were not selected, I want to thank them for their confidence in the Orthopterists' Society and for their efforts of presentation and formulation of their research projects. Their work was also greatly appreciated by the Committee and it is really encouraging to see such activity taking place across the world... unfortunately, our funds are limited and we had to choose. I invite them to submit further proposals at the next call (probably in early 2015).

ISSN assigned to *Metaleptea*

By **HOJUN SONG**

Editor, *Metaleptea*

The International Standard Serial Number (ISSN) is a unique identification number for serials. *Metaleptea* has been continuously published since 1978, but the journal has never had a formal ISSN assigned until now. I am pleased to inform our members that *Metaleptea* now has its own ISSN number (2372-2517 for online version and 2372-2479 for print version, located on the upper-right corner of the cover page).

So, what are the benefits of the ISSN? According to the U.S. ISSN Center within the Library of Congress, the ISSN results in accurate citing of serials by scholars, researchers, abstracters, and librarians and it

is used in libraries in multiple ways, including searching databases, identifying titles, ordering (especially in electronic order systems), check-in, and claiming of serials. For our members, this means that by publishing in *Metaleptea* you can reach a much larger audience. For our Society, this is an important step forward.

Thinking about this new change to our newsletter, I looked through some of the older issues of *Metaleptea*. From the very first issue of the newsletter published in the summer of 1978, at that time of the Pan American Acridological Society (PAAS), I discovered how our newsletter came to be called *Metaleptea*, which I reproduce here.

"When faced with the task of naming the Newsletter, the editors laboriously sought out some aspect of New World Acridology that would be symbolic of the goals of our society. To these ends, the name Metaleptea was chosen from a host of suggestions. One species of the genus Metaleptea is found distributed from Canada southward all the way through Chile, encompassing a major portion of the New World. What better symbolism of the PAAS and its unifying purpose than the animals shared by all New World Acridologists!"

Now, 36 years later, the Society has evolved into a global group, but the spirit of the founders still lives on.

Regional Reports - What's happening around the world?

South and Central America

By **MARCOS G. LHANO**

Universidade Federal do Recôncavo da Bahia (UFRB)
Centro de Ciências Agrárias Ambientais e Biológicas (CCAAB)
Bahia, Brazil

Last February, during the 30th Brazilian Congress of Zoology, at the Pontifícia Universidade Católica do Rio Grande do Sul, the “5th Brazilian Symposium on Orthoptera” took place. For this meeting the theme focused on was “Brazilian Biota of Orthoptera – Challenges and Perspectives.” The symposium was organized by Dr. Edison Zefa (Universidade Federal de Pelotas) and Dr. Maria Kátia Matiotti da Costa (Pontifícia Universidade Católica do Rio Grande do Sul), and they made a successful and important impact upon our scientific community. The symposium was organized to engage speakers who discussed interrelated themes and updated data regarding the different aspects of the biology of Orthoptera, especially taxonomy, ecology, cytogenetics, molecular biology, and bioacoustics. The main objective was to encourage the advancement of scientific knowledge about Neotropical orthopterans through the exchange of experiences, integration between research groups, and an increase in inter-institutional relations. The meeting also demonstrated the potential for further research in Orthoptera highlighting the great diversity of species that occur in different biomes and attracting new researchers to the group.

Over three days, the following topics (original titles in Portuguese) were presented:

1. “Brazilian Biota of Orthoptera project: general features and integration plan for the research network in

Brazil”, by Dr. Carlos Frankl Sperber (UFV – MG)

2. “Taxonomic descriptions in Orthoptera: carry out the role to clear the way for future researchers”, by Dr. Francisco de Assis Ganevo de Mello (UNESP – SP)

3. “To inventory the diversity of grasshoppers (Orthoptera, Acridoidea): where we are and where we want to go”, by Dr. Maria Kátia Matiotti da Costa (PUCRS – RS)

4. “Unraveling the genital complexity of grasshoppers”, by Dr. Fernando Campos de Domenico (USP – SP)

5. “Chromosome evolution and genomics in Orthoptera: a story told by molecular cytogenetics”, by Dr. Diogo Cavalcanti Cabral de Mello (UNESP - SP)

6. “Tettigoniidae of Brazil: diversity and distribution”, by Dr. Juliana Chamorro Rengifo (UFV - MG)

7. “Distribution and abundance of grasshoppers in Rupestrian Fields in Serra do Cipó, Minas Gerais, Brazil”, by Dr. Bruno Rodrigues Terra (UFOP – MG)

8. “Bioacoustics of crickets: state of the art in Brazil”, by MSc. Luciano de Pinho Martins (INPA - AM)

9. “Evolution and Ecology of Orthoptera: technical and theoretical challenges”, by Dr. Karla S. C. Yotoko (UFV – MG)

During the same Congress, Dr. Márcio Bolfarini (UNESP/Botucatu, SP) presented the symposium: “Cave Crickets: unclear studies” as part of the symposium “Subterranean Biology - the taxonomic impediment and proposed strategies for conservation of a hidden diversity.”

Also important were the presented posters because they assist in demonstrating the importance of this event and the growth of the Neotropical Orthopterology (original titles in Portuguese):

1. “A new species of the cricket genus *Eneoptera* Burmeister, 1838 (Orthoptera, Grylloidea, Eneopterinae) from Bahia”, by Luciano de P. Martins, Gabriel Lobregat de Oliveira & Edison Zefa

2. “Analysis of the Orthoptera fauna



associated with the decomposition of pig carcass”, by Rodrigo Gonçalves-Oliveira, Janyra Oliveira-Costa, Marina de Oliveira Barros & Bruna de Carvalho Generoso

3. “Characterization of Biotopes and analysis of composition of the species of grasshoppers (Orthoptera: Caelifera) at Serra do Cipo, Minas Gerais, Brazil”, by Bruno R. Terra, Marco Antonio A. Carneiro & Maria Kátia Matiotti da Costa

4. “Chromosomes of two species of Gomphocerinae grasshoppers (Orthoptera, Acrididae) from Chapada Diamantina, Bahia”, by Edison Zefa, Maria Kátia Matiotti da Costa, Anelise F. e Silva, Paulo Roberto Boeira Fuculo Jr., Giovanna Boff Padilha, Marcelo Ribeiro Pereira, Darlan Rutz Redü & Luciano de Pinho Martins

5. “Cladistic analysis of the phylogenetic relationships of the family Ommexechidae grasshoppers (Insecta, Orthoptera, Caelifera)”, by Fernando Campos de Domenico

6. “Comparative morphology of the phallus of katyids (Insecta: Orthoptera: Tettigoniidae)”, by Juliana Chamorro Rengifo & Cristiano Lopes-Andrade

7. “Effects of altitude, vegetation and substrate on the distribution and abundance of grasshoppers (Orthoptera: Caelifera) in the Serra do Cipó, Minas Gerais, Brazil”, by Bruno R. Terra, Marco Antonio A. Carneiro & Maria Kátia Matiotti da Costa

8. “First record of *Lerneca ornata* (Orthoptera: Gryllidae: Luzarinae) for Brazil and description of the calling song”, by Lúciene Gimague da Silva,

- Luciano de Pinho Martins & Augusto Loureiro Henriques
9. "First record of X1X20 sex determination mechanism in Gryllidae (Orthoptera, Grylloidea)", by Giovanna Boff Padilha, Luciano de Pinho Martins, Anelise Fernandes e Silva, Darlan Rutz Redü & Edison Zefa
10. "How to preserve samples of crickets for studies of stable isotopes of carbon and nitrogen?", by Fabiene Maria de Jesus, Marcelo Ribeiro Pereira, Cassiano Sousa Rosa, Marcelo Zacharias Moreira & Carlos Frankl Sperber
11. "Karyotype and mechanism of sex determination of a species of cricket *Diatrypa* Saussure, 1874 (Orthoptera, Grylloidea, Podoscirtinae)", by Anelise Fernandes e Silva, Darlan Rutz Redü, Luciano de P. Martins & Edison Zefa
12. "Karyotypes of two species of crickets of the tribe Phylloscyrtini (Orthoptera, Gryllidae)", by Paulo Roberto Boeira Fuculo Junior, Luciano de Pinho Martins, Anelise F. e Silva, Giovanna Boff Padilha & Edison Zefa
13. "Marking crickets (Orthoptera, Grylloidea) for ecological studies", by Fabiene Maria de Jesus, Enio Henrique Viana Araújo, Marcelo Ribeiro Pereira, Cassiano Sousa Rosa & Carlos Frankl Sperber
14. "Meiotic chromosomes and sex determination mechanism of three species of Ommatolampidinae grasshoppers (Orthoptera, Acrididae)", by Anelise Fernandes e Silva, Maria Kátia Matiotti da Costa, Paulo Roberto Boeira Fuculo Jr., Giovanna Boff Padilha, Marcelo Ribeiro Pereira, Darlan Rutz Redü, Luciano Martins & Edison Zefa
15. "Meiotic chromosomes of two species of grasshoppers of the genus *Amblytropidia* (Orthoptera, Acrididae, Gomphocerinae)", by Giovanna Boff Padilha, Maria Kátia Matiotti da Costa, Anelise F. e Silva, Paulo Roberto Boeira Fuculo Jr. Darlan Rutz Redü, Marcelo Ribeiro Pereira, Luciano de Pinho Martins & Edison Zefa
16. "Morphological analysis of five species of *Diponthus* Stål, 1866 (Orthoptera, Acridoidea, Romaleidae) and new records for the Rio Grande do Sul state, Brazil", by Maria Kátia Matiotti da Costa, Douglas da Rocha Sebben & Gervásio Silva Carvalho
17. "Morphology and cytogenetics of the grasshopper *Caruaruacris bivittatus* Matiotti da Costa & Silva Carvalho, 2006 (Orthoptera, Acrididae, Ommatolampidinae)", by Paulo Roberto Boeira Fuculo Junior, Maria Kátia Matiotti da Costa, Anelise F. e Silva, Giovanna Boff Padilha, Darlan Rutz Redü, Marcelo Ribeiro Pereira, Luciano de Pinho Martins & Edison Zefa
18. "Morphology of phallic sclerites of two sympatric species of crickets of the genus *Miogryllus* Saussure, 1877 (Orthoptera, Gryllidae)", by Emily Costa Silveira, Luciano de Pinho Martins, Darlan Rutz Redü, Rosiele de Fátima Cabreira Monteiro, José Eduardo Figueiredo Dornelles & Edison Zefa
19. "Morphology of the spermatozooids of *Melanotes* Desutter-Grandcolas, 1993 (Orthoptera, Grylloidea, Phalangopsidae, Luzarinae)", by Maria Luiza Fernandes, Marcelo Ribeiro Pereira, Marcelo Silva Barcellos, José Lino-Neto, Carlos Frankl Sperber & José Eduardo Serrão
20. "Morphometry of the spermatozooids of *Mellopsis* Mews & Sperber, 2010 (Orthoptera, Grylloidea, Phalangopsidae, Luzarinae): new evidence for the creation of a genus from *M. zefai*", by Maria Luiza Fernandes, Marcelo Ribeiro Pereira, Marcelo Silva Barcellos, José Lino-Neto, Carlos Frankl Sperber & José Eduardo Serrão
21. "New genus of Ommatolampidinae grasshopper (Orthoptera, Acridoidea, Acrididae) from the Atlantic Forest of northeastern Brazil, with chromosome supplement", by Maria Kátia Matiotti da Costa, Anelise F. e Silva, Marcelo Ribeiro Pereira, Darlan Rutz Redü, Luciano de Pinho Martins & Edison Zefa
22. "Redescription of *Argizala brasiliensis* (Orthoptera, Grylloidea, Trigonidiidae) including accounts of its diagnostic characters and *Argizala* relationship with other genera of Nearctic Nemobiinae", by Marcelo Ribeiro Pereira, Maria Luiza Fernandes, Luciano de P. Martins, Edison Zefa & Carlos Frankl Sperber
23. "Reproductive behavior of the cricket of shrub *Cranistus colliurides* (Orthoptera, Gryllidae)", by Elliott Centeno de Oliveira, Luciano de Pinho Martins, Gabriel Lobregat de Oliveira & Edison Zefa
24. "Similarities in calling song affect the temporal co-occurrence of species in an assemblage of crickets at the Atlantic Forest", by Gabriel Lobregat de Oliveira, Luciano de Pinho Martins, Edison Zefa & Carlos Frankl Sperber
25. "Taxonomical and functional responses of grasshoppers (Orthoptera, Caelifera) to the fire in the Southern Grasslands", by Claire Pauline Röpke Ferrando, Luciana Regina Podgaiski, Maria Kátia Matiotti da Costa & Milton de Souza Mendonça Jr.
26. "The assemblage structure of grasshoppers (Orthoptera, Acridoidea) in an altitudinal gradient in rupestrian fields", by Felipe Donateli Gatti, Carlos Henrique M. Menezes, Marco Antonio A. Carneiro & Maria Kátia Matiotti da Costa
27. "The curatorship of Orthoptera (Insecta) of the collection Prof. José Alfredo Pinheiro Dutra", by André Fonseca Antunes & Daniela Maeda Takiya
28. "Three new species of *Brasilodontus* de Mello, 1992, from the Atlantic Forest (Gryllidae, Landrevinae)", by Lucas Denadai de Campos, Marcio Perez Bolfarini & Francisco de Assis Ganeó de Mello
29. "Two new species of the cricket genus *Hygronemobius* Hebard, 1913 (Orthoptera: Grylloidea: Nemobiinae) from Central Amazon", by Luciano de P. Martins, Marcelo R. Pereira, Lúciene Gimaque da Silva, Augusto L. Henriques & Edison Zefa

At the main congress, the Brazilian Society of Zoology announced the winner of the "**Rodolpho von Ihering Award**" for the best Brazilian Ph.D. thesis in the field of Zoology, the defense of which occurred in the period from November 1, 2011 to October 31, 2013. This year's winner was Dr. Fernando Campos de Domenico, with the thesis: "Phylogenetic study of the family Ommexechidae (Orthoptera, Caelifera, Acridomorpha)" (Advisor: Dr. Eliana Marques Canello, Museum of Zoology, USP). Congratulations!

Also this year, Martina Eugenia Pocco got her **Ph.D. degree** in March from the Universidad Nacional de La Plata (Argentina), with the thesis: "Neotropical Romaleini (Orthoptera: Acridoidea): biodiversity, phylogeny and biogeography" (Advisor: Dr.

Maria Marta Cigliano). Additionally, Daniela Santos Martins Silva received her **MSc. Degree** in February from the Universidade Federal do Recôncavo da Bahia (Brazil) with the dissertation: “Grasshoppers (Orthoptera: Acrididea) in conservation areas in the Central Corridor of the Atlantic Forest, Brazil” (Advisor: Dr. Marcos Gonçalves Lhano).

Recently announced by The Orthopterists’ Society, the proposal to organize the **12th International Congress of Orthopterology** was accepted and Brazil will have the opportunity to host the meeting for the first time. This will be a great opportunity to magnify and grow the scientific community of our region. Much care and dedication will be taken to keep

up the success of past ICO meetings, supplying the participants with interesting programming, memorable discussions, and the Brazilian way of receiving our visitors. It will be a pleasure to host the event here, so, dear fellow orthopterologists, welcome to Brazil!

East Europe - North and Central Asia

By **MICHAEL G. SERGEEV**

Novosibirsk State University
Institute of Systematics and
Ecology of Animals
Russia

The first joint expedition of Chinese and Russian orthopterists was organized in July, 2013. The altitudinal distribution of Orthoptera and Plecoptera was studied on the northern macroslope of Eastern Tian Shan. Several endemics of this area (*Euthystira xinyanensis*, *Eremitusacris xinjangensis*) and the northern part of the Tian Shan Mts. (*Montana tianshanica*) were found.

Outbreaks of the Migratory, Italian, and Moroccan locusts, and several other grasshopper species continued in different semi-arid and arid regions of the former USSR. This resulted in some active discussions between acridologists and plant protection specialists and managers during the 3rd All-Russian Plant Protection Congress, which was held in Saint-Petersburg in December, 2013. Several acridologists from Russia and Kazakhstan characterized the population dynamics of the locusts (especially the Italian one) and grasshoppers and discussed some possible approaches to manage their populations in different areas during outbreaks and between them. Several presentations were also devoted to some new opportunities of biological control of locust upsurges.

Several applied acridologists and



The Italian locust (*Calliptamus italicus*) (solitary male) is one of the most economically and ecologically important species in the plain and mountain steppes and semi-deserts of Central Asia and south Russia. (Photo credit: M. G. Sergeev)

plant protection specialists were involved in the FAO “Five-year Programme to improve national and regional locust management in Caucasus and Central Asia (CCA)” officially launched in October, 2011 (<http://www.fao.org/ag/locusts-CCA/en/index.html>). In 2013, two special meetings were organized, namely “Locust geographic information system (GIS) workshop” and “Technical workshop on locusts in Caucasus and Central Asia (CCA)” (both in November in Tashkent, Uzbekistan). Besides that, the group of acridologists from Georgia, Kazakhstan, Russian Federation, Turkmenistan, Uzbekistan, and

the U.S.A. have almost finished the editing of three books concerning the main pest species of this area, namely the Italian, Migratory, and Moroccan locusts. These books will be published soon in Russian and later in English.

Western Europe

By **FERNANDO MONTEALEGRE-Z**
 School of Life Sciences
 Riseholme Campus
 University of Lincoln
 United Kingdom



As the new regional representative of the society in Western Europe, I think that my first report should present a general overview

of the current situation in terms of the research in orthopteroid insects in this part of the Old World. I have ventured a search of member expertise and research activities using the OS member database as well as social networks (e.g. Facebook) to track colleagues actively showing some research interest in orthopterans. In this search I have divided our fields of interest into six major categories as follows: 1) Ecology, Behavior & Conservation, 2) Genetics, Molecular & Evolution, 3) Systematics and Taxonomy, 4) Physiology, Neurophysiology, Biomechanics, 5) Bioacoustics, and 6) Management/Agriculture.

This report focuses on the number of individual researchers, rather than on research groups. Usually the individuals counted are the heads of research labs, and I have also included independent workers with a particular

Table 1. Number of Orthopterists, in Western European countries, categorized by research field and major interest.

Country/Research Interest	Ecology, Behaviour & Conservation	Genetics, Molecular & Evolution	Systematics, Taxonomy	Neurosciences Physiology & Biomechanics	Bioacoustics	Management & Agriculture
Austria	5	1	2	3	3	0
Belgium	0	0	1	0	0	0
Croatia	0	0	2	0	0	0
Czech Republic	0	0	1	0	0	0
France	6	7	10	2	4	3
Germany	3	5	15	10	8	1
Hungary	2	1	0	0	0	0
Italy	5	2	8	0	3	1
Netherlands	0	0	4	0	0	0
Slovakia	1	0	0	0	0	0
Spain	4	1	3	0	4	2
Switzerland	0	1	4	1	0	0
United Kingdom	3	5	7	10	9	3
TOTAL	29	23	57	26	31	10

interest in Orthoptera. Since the six categories do not exclude from each other, a researcher might focus his/her research across several fields, so the analysis might overestimate the real number of researchers currently working on specific areas. For instance, if a researcher works on taxonomy but also has an interest in physiology, s/he was scored twice, one for each respective category. In a similar manner the total number of researchers found might be compromised because the students of most labs were, perhaps, not completely counted. Nevertheless,

these preliminary results might reflect the current activity and interest of members and non-members of the society in Western Europe.

The results of this preliminary search are shown in Table 1 and Figure 1. Except for agricultural research, it can be said that in Western Europe we have a relatively balanced proportion

of researchers working on categories 1, 2, 4 and 5. Category 3 (Systematics and Taxonomy) shows that a relatively large proportion (32%) of researchers have an interest in these two areas. However, as mentioned above, some of these likely integrate these two disciplines with others or do taxonomy as a hobby. I could not find a substantial amount of inputs for category 6, which is in certain ways peculiar as agriculture has traditionally been a field of attention and held as important to the economy of different countries in this region.

An interesting idea would be to carry out the same analysis in other regions and compare the tendencies. Of course, one would expect to find significant differences in research trends across regions as research support varies and is prioritized differently across countries. A sharper resolution analysis might tell us more about the specific fields of active research and the interests of our members, as well as other research somehow linked to the society. In this regards, it will be interesting to know how many researchers actually focus on single and pure research fields compared to how many carry out their research across different fields, etc.

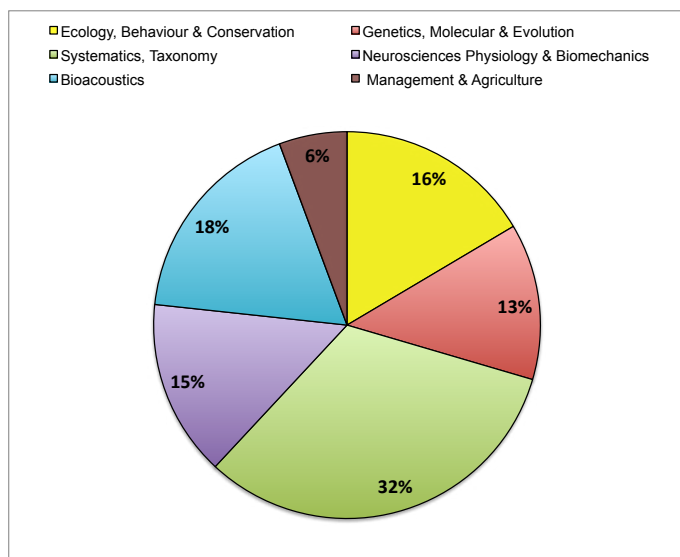


Figure 1. Pie chart showing the proportion of Orthopterists in Western Europe organized by research fields.

Japan

By **KAORI TSURUI**

Okinawa Prefectural Plant Protection Center
Department of Ecology and Environmental
Science, Faculty of Agriculture,
University of the Ryukyus
Ryukyu-Sankei Co., Ltd.

Self-introduction and present works

I am studying behavioral ecology. My research interests are defensive traits in grasshoppers, especially cryptic coloration (camouflage) and autotomy (the ability to spontaneously self-amputate a limb or other appendage). I am also fascinated with trade-offs between the benefits of defensive traits and other fitness components, such as mating success and thermoregulation.

Species that are polymorphic in color patterns are particularly useful as model systems in camouflage research because their discrete variation is feasible for evaluating camouflage effects of different body color-markings. Therefore, I am studying a polymorphic pygmy grasshopper, *Tetrix japonica*, that has various markings on the back (Fig. 1). We have demonstrated that the different morphs are not equivalent in the degree of crypsis, suggesting that trade-offs exist between the camouflage benefit of body coloration and other fitness components [1]. In addition, an investigation of the relationship between the frequency of morphs with black marking and latitude in *T. japonica*, based on the specimens kept at the Osaka Museum of Natural History revealed a clear latitudinal cline in males, with greater proportion of the morphs with black marking in northern areas, except for Hokkaido populations. By contrast, almost all females were morphs with black marking [2]. This sex-linked marking polymorphism might be partly explained by size-dependent predation risk in the sexually size-dimorphic *T. japonica* [3]. I would like



Figure 1. Color-marking polymorphism in the pygmy grasshopper *Tetrix japonica*

to understand more about the genetic background of the latitudinal cline in *T. japonica* in the future.

Autotomy in a rice grasshopper, *Oxya yezoensis* (Fig. 2), occurs only in the hind limbs, which function in jumping, and never in the fore- or mid-legs. This limb amputation typically occurs as a specialized defensive response to an attack from a predator and thereby enables the prey to escape from predation. Despite the benefits of escape, autotomized organisms lose the body part and its associated function. I am currently studying the jumping behavior and performance of one-leg-autotomized *O. yezoensis* not only ecologically but also kinematically and mechanically with robotics researchers. Our results suggest that *O. yezoensis* may alter their take-off elevation after limb autotomy to minimize the reduction in jumping distance [4]. To understand the physical mechanisms of one-leg-jumping, kinetic analyses using a high-speed camera are ongoing.

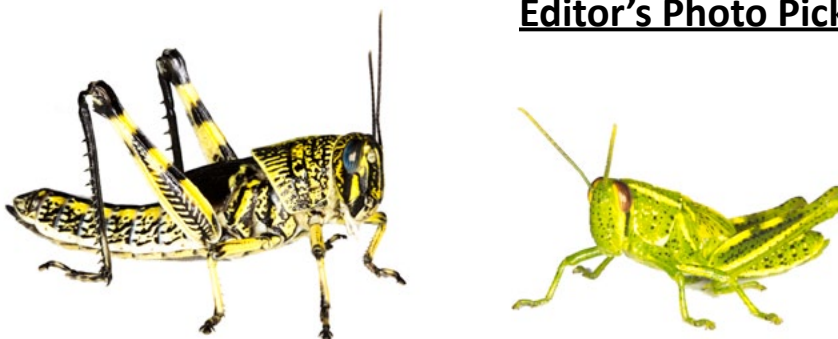


Figure 2. The rice grasshopper *Oxya yezoensis*

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- [2] Tsurui K, Honma A, Nishida T. 2013. Size-dependent predation risk partly explains the sex-related marking polymorphism in the sexually size-dimorphic pygmy grasshopper *Tetrix japonica*. Entomological Science, 16(2) 136–144.
- [3] Tsurui K, Nishida T (2010) Latitudinal clines of the black-marking morph in a pygmy grasshopper *Tetrix japonica* (Orthoptera: Tetrigidae). Bull Osaka Mus Nat Hist 64: 19–24. (In Japanese with English abstract).
- [4] Tsurui K, Narita S, Iwatani Y, Honma A. on line. Change in take-off elevation angle after limb autotomy mitigates the reduction in jumping distance in rice grasshoppers *Oxya yezoensis*. Entomological Science.

Editor's Photo Picks



Nymphs of *Schistocerca lineata* (left) and *S. ceratiola* (right), two North American members of the grasshopper genus *Schistocerca*. (Photo credit: H. Song)

The Orthopterists' Society Grant Reports

Dual-Purpose Armaments in *Pristoceuthophilus* Camel Crickets

By LAUREN CONROY
California State University Northridge

Forced copulation is an alternative mating behavior in many taxa, where it is usually employed by small, poor-condition, or otherwise inferior males that have little chance of enticing a female to mate voluntarily (Clutton-Brock & Parker 1995). In vertebrates, males typically use larger body size, relative to females, to achieve forced copulation (McKinney et al. 1983). In insects, forced copulation is often facilitated by specialized male clasping structures, such as the abdominal “gin trap” in sagebrush crickets (Sakaluk et al. 1995). However, in the camel cricket *Pristoceuthophilus marmoratus* (Rhaphidophoridae), males use hind leg weaponry, consisting of bent tibiae and spines on enlarged femora (Figure 1), not only to achieve forced copulation (Figure 2), but also to fight with other males (Haley & Gray 2012). In both intra- and intersexual interactions, males attempt to pin their opponent, or unwilling mate, against the spines on their hind femora. When subdued thusly, females are subjected to forced copulation.

To the best of my knowledge, this is the first example of male weaponry traits being used for both male-male agonism and sexual coercion. The novelty of such “dual-purpose” armaments prompted me to explore the genus *Pristoceuthophilus* in order to determine: (1) whether hind leg armaments are used for one or both purposes in other morphologically similar species, and (2) whether the fighting or coercive mating function of hind leg weaponry might have arisen first.

To accomplish these objectives, I performed male-male and male-

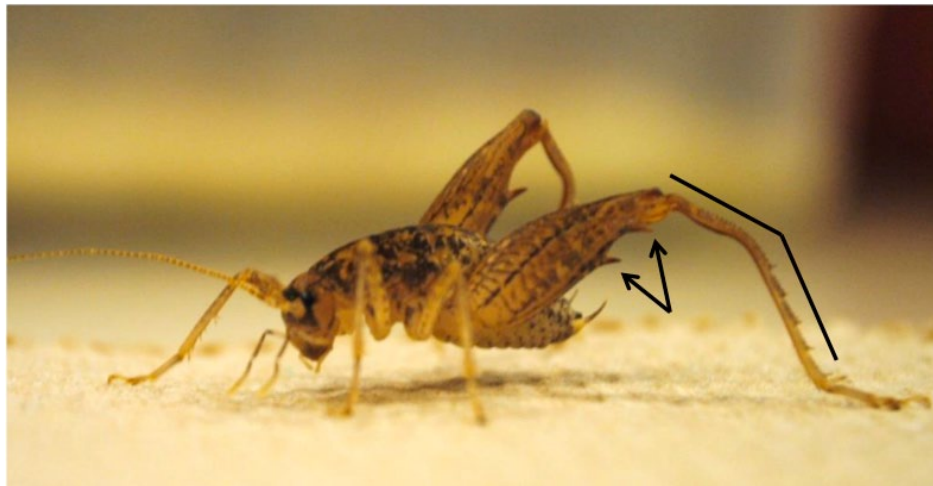


Figure 1. Hind leg armaments in a *P. marmoratus* male. The femoral spines and tibial bend are indicated.

female behavioral trials in three other species of *Pristoceuthophilus* (approximately twenty *Pristoceuthophilus* species have similar hind leg morphology to *P. marmoratus*; T. Cohn, pers. comm.). These species are officially undescribed, but were known to the late *Pristoceuthophilus* expert Ted Cohn. I collected *P. 'Huachuca summer'* from the Huachuca Mountains in Arizona in July 2013, *P. 'Madera'* from Madera Canyon in Arizona in October 2013, and *P. 'Mt. Pinos'* from Mount Pinos in California in July 2013. After collection, individuals were brought to the lab for behavioral trials. Male-male trials consisted of two males plus a female as incentive for males to fight for, while male-female trials consisted of one male and one female. Behavioral trials lasted three hours each and took place under red light to minimize light disturbance. During trials, I recorded whether fighting, attempted forced copulation, or successful forced copulation took place.

Male-male fighting with hind legs took place in all species, while forced

copulation was attempted in two species (*P. 'Huachuca summer'* and *P. 'Mt. Pinos'*) but was not successfully completed (i.e., a male grabbed a female with a hind leg, but she escaped before the male could force genital coupling to occur). However, successful forced copulation occurs at extremely low rates in *P. marmoratus* (observed in 4 out of 101 trials in another study; Conroy & Gray, under review), so it is likely that I did not perform enough trials in these three other species to see successful forced copulation (I performed ca. 20 male-male and 20 male-female trials for each species). Therefore, I tentatively conclude that hind leg-facilitated forced copulation occurs in at least two species of *Pristoceuthophilus* other than *P. marmoratus*.

The results of my study indicate that dual-purpose armaments, a novelty in sexual selection literature, may be widespread in the genus *Pristoceuthophilus*. Given that hind legs were used for male-male fighting in all species for which trials were performed, while sexual coercion

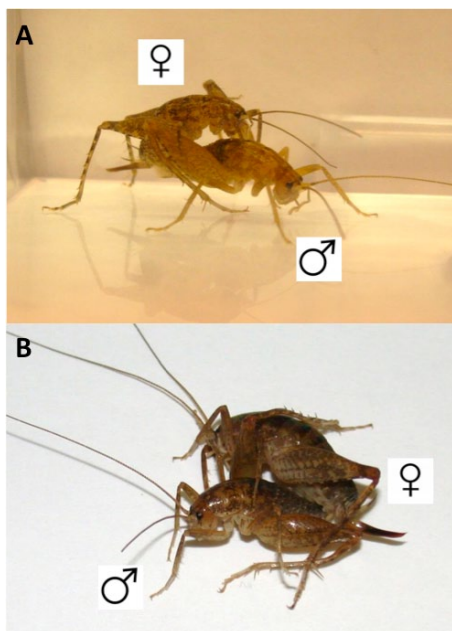


Figure 2. Voluntary and forced copulation in *P. marmoratus*. (A) In voluntary copulation, the female is mounted on top of the male; his hind legs do not touch her. (B) In forced copulation, the male grabs and subdues the female with one of his hind legs. The female is on the ground, on her side, rather than on top of the male.

occurred at much lower rates and has only been conclusively demonstrated in *P. marmoratus*, I assert that the fighting function of hind leg weaponry evolved first, and that hind leg armaments were exapted for mating coercion secondarily (sensu Gould & Vrba 1982). Determining where in the evolutionary history of this genus this exaptation occurred will require behavioral analysis of all twenty species of *Pristoceuthophilus* with this hind leg morphology, but my study laid the groundwork for further exploration

of this uniquely dual-purpose male weapon.

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Vibrational Communication in the New Zealand Cook Strait Giant Weta (*Deinacrida rugosa*)

By **ASHLEY P. SCHMIDT**
Department of Biology
Augustana College

Studies of communication in orthopterans have led us to understand that this diverse group of insects utilize a variety of mechanisms and modalities for information transmission. However, unlike the extensive catalog of studies focused on acoustic and chemical communication, vibrational signaling in orthopterans has until recently received little attention. Over the past twenty years a robust body of research has accumulated that has begun to unravel the mystery that surrounds how insects produce vibration, and how communication through substrate-borne vibration has generally evolved (Hill 2001, 2008; Bradbury and Vehrencamp 2011). What we have learned from this growing body of literature is that we have merely scratched the surface in regard to the biological prevalence of vibrational communication (Croft and Rodriguez 2005), especially in the Orthoptera.

Mechanisms that insects utilize to

produce and transmit vibrational signals are variable and can include stridulation, drumming, and tremulation (Stratton and Uetz 1983; Zunic et al. 2008). Vibration itself is more properly referred to as a substrate-borne disturbance, whether that substrate is a leaf, stem, soil, or spider web (Hill 2008), and regardless of how it is produced. Tremulation, the oscillation of the abdomen, either dorso-ventrally or laterally through body vibrations, can allow arthropods to send a variety of substrate-borne signals (De Luca and Morris 1998). These vibrational signals are usually transmitted to the substrate through the legs and tend to be low-frequency, narrow-ranged, and often vary with body morphology and the physical motion of the sender (Drosopoulos and Claridge 2006; Hill 2009). While previous studies have described tremulation in arthropods on surfaces such as leaves and stems (Morris et al. 1994), no prior research has documented the transmission of vibrational signals on or through

the soil using tremulation. Here we show for the first time that the Cook Strait giant weta (*Deinacrida rugosa*) uses tremulatory signals transmitted through the soil to produce substrate-borne signals, and that these signals are used primarily in inter-male agonistic interactions.

The giant weta (genus *Deinacrida*) are a group of nocturnal, herbivorous, apterous Orthopteran insects belonging to the family Anostomatidae (Field 2001; Fig. 1). Representing some of the largest insects ever described (the mass of one female *D. rugosa* has been documented up to 70 g), this genus of New Zealand endemics is thought to possess a vicariant origin, with eleven extant species (Morgan-Richards and Gibbs 2001; Trewick and Morgan-Richards 2004). The Cook Strait giant weta, *Deinacrida rugosa*, was historically found along a corridor between the North and South Islands of the New Zealand mainland. Currently listed as highly endangered by the New



Figure 1. Male (right) Cook Strait giant weta (*Deinacrida rugosa*) courting a female (left). The vibrational signals produced by males are not used for courtship, but are used in inter-male contests.

Zealand Department of Conservation, it is now restricted to a few protected island reserves from which introduced mammalian predators have been eradicated. While some studies have shown that some *Deinacrida* species can produce an acoustic alarm signal (Field and Roberts 2003), the primary mechanism of communication in this terrestrial group of Orthopteran insects remains poorly understood. From a small collection of live insects transported to the University of Toronto in 2008, we found preliminary evidence for the use of vibrational signaling in the species. Thus, in our study we sought to determine the structure and function of these substrate-borne vibrational signals.

Methods:

The study was conducted in January 2012 and 2013 on Mātū Island Scientific and Historic Reserve (-41.257°S, 174.865°E). Owned by New Zealand Māori Te Atiawa, Taranaki, Ngāti Tama, and Ngāti Ruanui Iwi, and managed by the New Zealand Department of Conservation, Mātū Island has been free of introduced mammalian predators since the late 1980's due to intensive eradication efforts. Thus, a large population of the focal species can be found and collected at this site.

Due to their nocturnal nature, Cook Strait giant weta of both sexes were opportunistically hand-collected between the hours of 22:00-23:30 using red spectrum headlamps to minimize disturbance.

For purposes of obtaining substrate-borne vibrational recordings in 2012, an arena of proprietary construction design was used. Intra- and inter-sexual pairings of Cook Strait giant weta were placed in the arena center, then vibrational signals were recorded to determine the social context of signaling. We recorded substrate-borne vibrational signals using a Polytec PDV-100 portable Doppler laser vibrometer sending digital signals

to a Marantz PMD-661 digital audio recorder, and we documented all interactions using a Sony high definition video camera.

In 2013, we conducted vibrational playback experiments. For these experiments we used a synthetic signal that was created, filtered, conditioned, and calibrated for spectral and temporal accuracy from a vibrational recording taken from a male *D. rugosa* the previous year. The synthetic signal was amplified and played back through an electromagnetic exciter coupled to the arena substrate (see De Luca and Morris 1998 for similar playback methods). Individuals in various pairing combinations were placed in the center of the arena and subjected to the vibrational playback after a ten minute resting period. Responses to the vibrational playback signal were documented again using both video and digital audio recordings.

Results:

Vibrational signaling interactions were first detected between *D. rugosa* males while in the presence of a female during our 2008 laboratory trials. This was confirmed in 2012 when high-speed videography revealed that vibrations were being created by dorso-ventral tremulation. Recordings also revealed that when two males were in the presence of one female, a duetting contest between the two

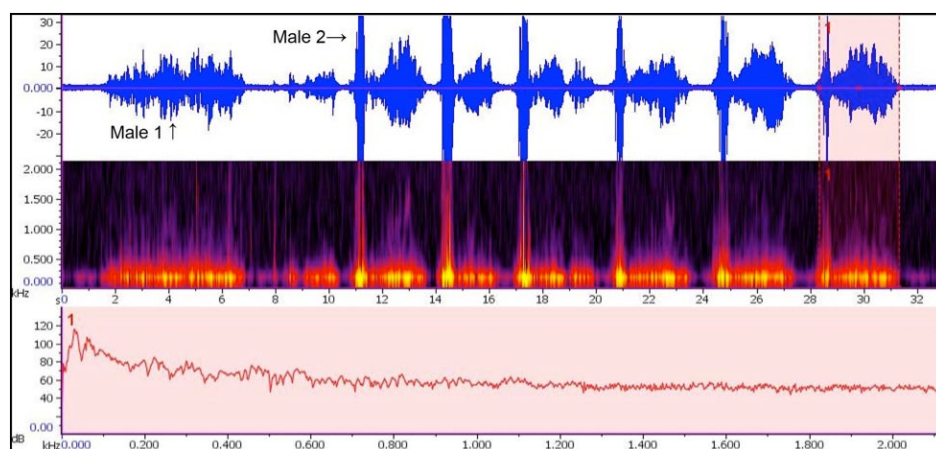


Figure 2. Oscillogram (top), spectrogram (center) and FFT (bottom) of a vibrational duetting bout in a pair of *Deinacrida rugosa* males. A vibrational duetting contest would typically result in one male abandoning courtship efforts and the winning male remaining in the presence of the female.

males would typically arise, with alternating vibrational signals produced by the males. The tremulations ceased when one male abandoned the contest and the winning male remained in the presence of the female (Fig. 2).

Our analysis revealed that substrate-borne vibrational signals occurred significantly more often in the male-male-female context than any other social context ($\chi^2 = 18.125$, $df = 3$, $p < 0.001$), with the males producing the vibrational signals (Fig. 3).

Playbacks were utilized to discriminate between the two possible functions of the male's substrate-borne vibrational signal: aggression toward other males or courtship of a female. A binomial likelihood ratio test found that males produced a vibrational signal in response to playback significantly more often in a male-male-female social context ($\chi^2 = 18.073$, $df = 3$, $p < 0.001$). There were no occurrences of male or female vibrational response to the playback signal in any other social context. Videographic analyses showed that both males and females exhibited negative vibrotaxis in response to the playback signal, spending significantly less time than expected in the region of the arena associated with the playback stimulus (One-sample test, males; $t = -14.32$, $df = 18$, $p < 0.001$; females; $t = -2.95$, $df = 18$, $p = 0.009$).

Discussion:

The communication system of the endemic New Zealand genus *Deinacrida* has long remained a mystery. Evolving in isolation for 80 million years on the New Zealand microcontinent, the eleven extant member species occupy a variety of niches from sea level to the alpine zone (Gibbs 2006). The group's wingless evolutionary heritage has led to speculation that this species may utilize chemical cues as a primary communication modality. While our study does not address nor eliminate that as an alternative explanation, here we characterize the tremulatory signals and

show for the first time that a species in the group uses substrate-borne vibrational signals in intraspecific communication.

Our data show that the highest prevalence of vibrational signaling occurred when a pair of males were placed in the presence of a female. Males often engaged in a vibrational duet, whereupon one male would typically exit the contest by fleeing. This provides preliminary evidence for the role of the signal in mediating agonistic interactions between males contesting for mates. The results from the playback experiments confirmed the function of the vibrational signal as a means of mediating inter-male aggression. Because the males had a vibrational response to the playback in the male-male-female social context, but not in any other context, we concluded that the male was using the tremulatory signal as an inter-male agonistic response rather than a courtship signal. In addition, both males and females spent less time near the playback stimulus than expected, providing evidence for the signal functioning as an agonistic signal.

Our findings provide the preliminary data for a more exhaustive study that examines the fate of substrate-borne signals in a group thought to have undergone ecological speciation and adaptive radiation. Signals transmitted through the substrate are often highly adapted to the transmission environment in which they pass. For animals that use vibrational signaling, like the Cook Strait giant weta, the exploitation of new niches may then be constrained by the transmis-

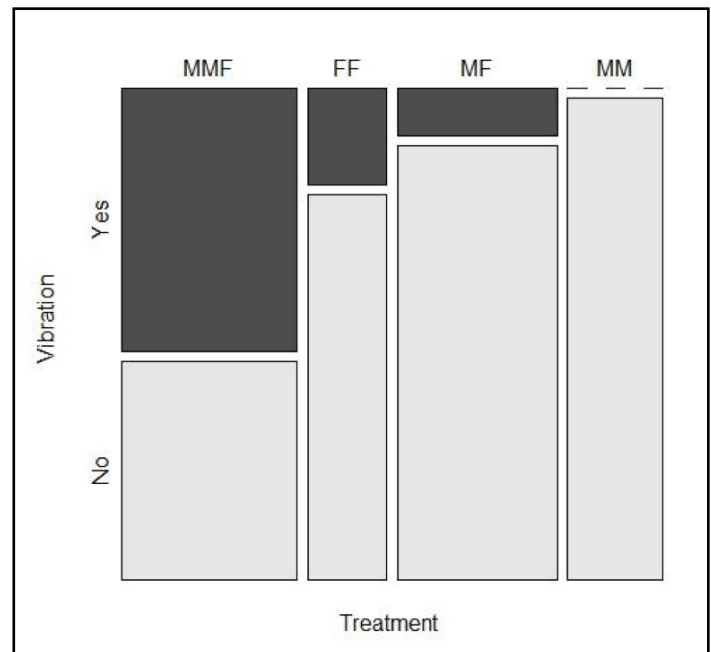


Figure 3. Mosaic plot of vibrational occurrences in various social contexts in the Cook Strait giant weta. Our study showed that vibrational signals are produced significantly more often in a male-male-female social context.

sion properties of the substrate. For example, our work on an alpine weta species in January 2014 found that *D. connectens*, a species that lives on rock fragment in high altitude scree fields, does not use such vibrational signals. The loss of substrate-borne signals in this alpine species was also accompanied with much higher levels of aggression between males. This further supports our hypothesis that vibrational signalling in giant weta likely serves to mediate aggressive interactions between males, by allowing contestants to assess their rival through non-contact signals, and lower the high cost of direct physical conflict.

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Effect of anthropogenic noise on the communication of *Oecanthus* tree crickets

By LAUREL B. SYMES & ROBIN A. COSTELLO

Department of Biology
 Dartmouth College

Interference from biotic and abiotic sources can obscure or shape communication channels in many types of organisms (Gerhardt 2001; Seehausen et al. 2008; Maan et al. 2010; Amezcuita et al. 2011). Anthropogenic noise represents a recent but pervasive addition to many environments, with demonstrated effects on the communication of many organisms (Barber et al. 2010). To assess how road noise, a specific form of anthropogenic noise, impacted the communication of tree crickets in the genus *Oecanthus*, we measured the direct effect of road noise on male calling as well as female phonotaxis. While males were 30% less likely to initiate calling in the presence of road noise, call features (amplitude, dominant frequency, and calling duration) were unchanged in the males that did call. In addition, playback experiments demonstrated that female phonotaxis was unaffected by the addition of high amplitude road noise. One possible explanation for this finding is that tree crickets have evolved to communicate in environments that are rich with conspecific and heterospecific signals, making them well-adapted

to communicate in the presence of anthropogenic interference. The combined findings from examining male signals and female responses suggest that tree crickets will experience minimal direct interference from road noise. However, the effect of road noise on trophic interactions (such as ability to detect predators or ability of predators to detect singing males) remains an open question.

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Liladownsia fraile: the rest of the story

By **DEREK A. WOLLER**

Department of Biology
University of Central Florida

As some of you are already no doubt aware, my colleagues (Paolo Fontana, Ricardo Mariño-Pérez, and Hojun Song) and I recently published a paper in *Zootaxa*, entitled: “Studies in Mexican Grasshoppers: *Liladownsia fraile*, a new genus and species of Dactyloptini (Acrididae: Melanoplinae) and an updated molecular phylogeny of Melanoplinae” (open access: <http://www.mapress.com/zootaxa/2014/f/zt03793p495.pdf>). We are very proud of the paper, especially since it contains a little of this and a little of that from molecular evidence to alpha taxonomy to habitat and (possible) host plant descriptions. All in all, it’s quite a robust work, in our opinion, but the thing that probably stands out the most is the name of the species. The genus name, for those of you unfamiliar with her (as I was originally), comes from Lila Downs (Fig. 1), a Mexican-American singer who was born close to the type locality in Oaxaca who promotes the cultural diversity of Mexico through her music. She also enjoys wearing

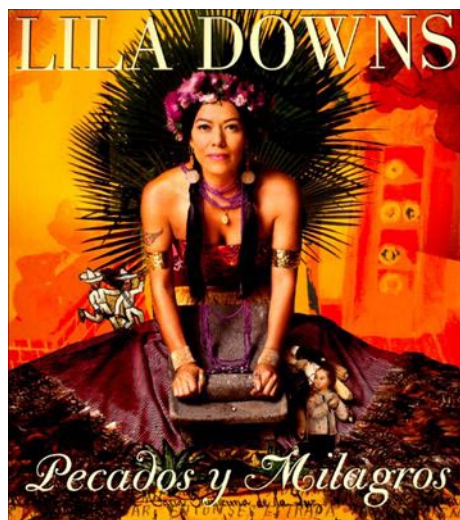


Figure 1. Lila Downs as she appeared on the cover of her 2011 album, *Pecados y Milagros* (Sins and Miracles).

bright and vibrant colors, often characteristic of Mexican culture, and this new species reflects that well (Fig. 2).

Due to its fantastic colors and fairly large size (Fig. 3), we were astounded that no one had yet described this species on behalf of science when we, quite randomly, came across the type locality back in 2011. In fact, I briefly touched on this tale in my “Musings on Mexico: A Mexican Travelogue” article in *Metaleptea* 32(1). In a nutshell, Paolo, Ricardo, and Paola Tirello, and I (Fig. 4) were on an expedition around southern Mexico to collect Pyrgomorphidae species for Ricardo’s Ph.D. project and we were headed to San José del Pacífico (highly recommended!) towards a known species locality. To get to the town, you must drive up an extremely windy road through a pine forest and as we neared our destination, Paolo looked out the window to the left, towards the dense forest, and saw a break in the brush where a crude road had been made (Fig. 5). Now, if you have never met Paolo, then let me say that his instincts for finding orthopteroids are quite impressive. I have seen him head across a field to pick up a phasmid on the other side. Yes, I am exaggerating slightly, but not much, I assure you. Anyway, he suddenly says “Stop the car. We need to check this habitat”, so I turned around (some-



Figure 2. Field photographs of both sexes of *Liladownsia fraile* from the type locality: A. Female. B. Male. (Photo credits: D.A. Woller & P. Fontana)

how), parked on the faded road he had spotted, and we fanned out in search of...nothing...Minutes went by with not even a common hopper to be had when SUDDENLY: “A very strange nymph! I have never seen before!”, Paolo exclaims excitedly. We all took a look and remarked that the colors were quite vibrant and noted its fairly large size. With renewed energy, we went back to hunting in our own ways when I saw something move across a plant near my waist. I bent down for a closer look and, lo and behold, a fiery rainbow emerged into the sun and we had captured our first adult! With renewed vigor, we all continued the pursuit until we all emerged victorious with at least one specimen

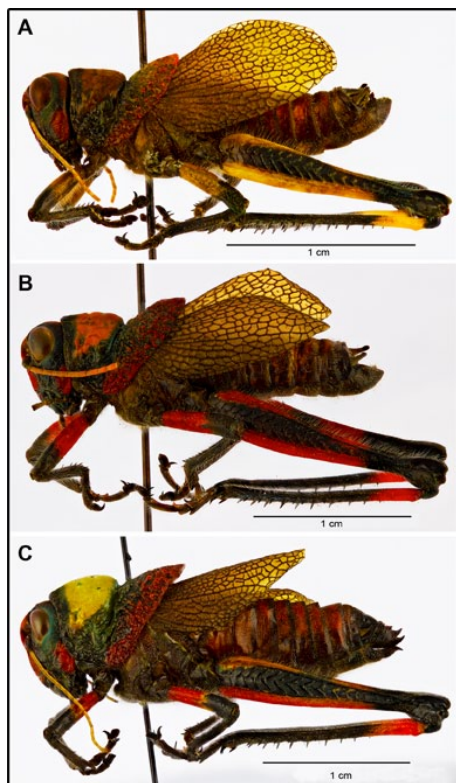


Figure 3. Photographs of preserved specimens of both sexes. A. Male; holotype; lighter color form. B. Male; paratype; darker color form. C. Female; paratype. (Photo credit: D.A. Woller)

apiece. A hard-fought battle through waist-high weeds, spiny plants, dense needles, and the unfortunate trash that came with being on the side of a main thoroughfare, but well worth it!

We traveled into the town next and struck up a conversation with a local man while looking around for more localities. We showed him the specimens and asked him what he knew about this particular grasshopper. If you have never spoken with locals while collecting, you really should because they are sometimes filled with relevant information (and some can catch things really, really well) as was the case here. The man took a look and casually said something along the lines of (in Spanish, of course): “Oh, that? We call that the friar. I see those around here sometimes”. Naturally, we were a bit taken aback because we were so thrilled and he was so serene, but, really, if you owned a dairy farm, you’d act the same if city tourists came to see the cows and acted as if they were exotic. For the non-Spanish speakers, “fraile” means friar (or

monk), so we have honored the local name for this grasshopper in the specific epithet of the species name. I personally feel that it’s important to acknowledge such connections wherever possible. After all, more often than not, species are simply new to science and not often to local peoples.

I mentioned earlier that we were incredulous that no one had yet described this species, but it turns out we were rather lucky because, in fact, it had been discovered previously in 1962, not far from the type locality. We discovered this when Ricardo traveled to Paris, France during this past spring on a European tour to photograph type pyrgomorphid specimens housed within various collections. While there, on a whim, he showed the newly-made plates of *L. fraile* to Simon Poulain, the curator of the Muséum national d’Histoire naturelle (MNHN), and he quickly opened some drawers and located a small box containing two specimens (male and female) of the species. A note accompanied them and said something along the lines of: “I think this is new, let’s describe it”. These specimens are included in our paper as paratypes.

Then, when David Rentz saw our paper come through over at *Zootaxa*, he saw the photos and swore he knew where some more specimens might be curated, so he contacted a few institutions, one being the California Academy of Sciences which he had worked in the seventies. However, the curatorial staff at the Cal Academy (and all other museums) were unable to find the specimens. I relayed this story to Ricardo who then showed me a note that accompanied the MNHN specimens that stated that they had been borrowed from the Cal Academy 20 years prior, which means they are most likely the same ones David saw! Presumably then, Christiane Amédégnato took an interest in them sometime after David’s trip there, borrowed them, and most likely, did not have the time (where does it go!?) for a formal description. We are now immensely curious if any other specimens of this beautiful species are hiding in other collections out there. If you find some, let us know because more phenological data would be especially useful.

As I wrote this piece, yet another piece of the puzzle revealed itself.



Figure 4. The intrepid explorers at the type locality holding *Salvia elegans* (pineapple sage), the potential host plant for *Liladownisia fraile*. Left to right: Paola Tirello, Paolo Fontana, Ricardo Mariño-Pérez, and Derek A. Woller. (Photo credit: D.A. Woller)



Figure 5. Photo of the type locality habitat. (Photo credit: Google Maps' Street View)

I was suddenly curious as to how the specimens came to be at the Cal Academy in the first place, so I went to our paper and looked at the collector: J. Stuart Rowley. A preliminary google search turned up nothing of interest, so I put in the name, plus “Orthoptera” and, for whatever reason, this revealed a French Wikipedia page (that I translated into English using google) with some interesting information, but nothing about Orthoptera on it, bizarrely. Still, despite it being a wiki entry, it makes some sense. The “J.” stands for John and he was an American ornithologist born in 1907 in California who did much good for the Cal Academy until 1933 when he set out on his own to raise birds in Baja California. This is relevant because in 1958 he began leading expeditions to Oaxaca to collect birds. Thus, it must have been on one of those trips that he encountered what is now known as Lila Downs’ friar grasshopper. Shortly after, in 1968 (only 6 years after his hopper discovery), he met his end all too early from an undescribed accident in the Sierra Madre del Sur, a mountain range in Oaxaca and the home of this new species. Eerie. All in all, a fascinating story, I think, and we have a lover of a major enemy of our beloved orthopterans to thank for it, in a manner of speaking.

I’d like to close out this essay by mentioning that, although the merits of naming a species after a pop culture icon (multiple Grammy-winning, in this case) are debatable (and the debate is definitely worth having –

someone set up a symposium and let’s do it!), there are benefits as well. The most obvious one is recognition of our hard work by a much larger audience. The science crowd is wonderful, of course, but to show the public

what we do and why on a larger stage is often much simpler than explaining it to a few interested parties, and the portal, in this case, was Lila Downs. We contacted her well before publishing the paper to see what she thought and she loved the idea, especially since it made sense to her as well (ie. the Oaxaca and color connections). Once it was finally published, she was ecstatic, but also on tour (and still is), so a meet-and-greet is currently out of the question. That was publicity plan A, so we went with B and had an article written up about us and the paper on the University of Central Florida’s (where the Song Lab is located) website using Lila Downs as the selling point.

That was the spark that lit the week-long fuse and the article rapidly underwent a series of permutations and started popping up all over the web, so much so, that a google inquiry into “*Liladownsia fraile*” while I write this brings back 2,000 results (and constantly growing!), which is truly astounding since it was obviously zero prior to publication. To be fair, most of those are probably re-posts of the original article or mentions of the name in comment sections of sites, but it is still remarkable. Then, later that same week, things really took off when EntomologyToday, a news site run by the Entomological Society of America posted their version of the original article, which was picked up by Lila Downs herself and re-posted on her Facebook and Twitter sites. After that, it was reported to me that

EntomologyToday’s page views were their highest ever (in the thousands) and Lila’s fans began re-posting the article all over the world. They also left a plethora of supportive and appreciative comments about our naming the hopper after her as well as noting what a fitting homage it is.

Another benefit of naming a species after a celebrity?: the possible channeling of such goodwill and appreciation for a type of creature that is normally ignored (and even reviled) into a more conservation-oriented mindset. Towards that end, this species was chosen to be included in the upcoming Red List of threatened species put out by the International Union for Conservation of Nature (IUCN) and has been classified as “endangered”. Axel Hochkirch of the Grasshopper Specialist Group of the IUCN has been searching for candidate species to be included on the forthcoming list and Paolo suggested that we should submit *L. fraile* since it is only known from a relatively small region in Oaxaca and the known populations appear to be quite diminutive for reasons unknown. We strongly urge others to head out there and look for more. Again, any further information you can add to our general knowledge of their behavior, habits, diet, etc. would be very interesting to know.

Lastly, one of the web comments regarding one of the posted articles revealed yet another potential benefit of getting the word out to the public: potentially locating new localities. A fellow from Mexico swears he saw a few specimens of *L. fraile* when he was younger near his home in Oaxaca, but about a 100 miles northwest. Perhaps the guy is misremembering, but, still, it is worth checking out if a field expedition is going near that particular area. And on that note, as Paul Harvey used to say, “and now you know the rest of the story”. Until next time!

Editorial

By **HOJUN SONG**
Editor, *Metaleptea*

It was five years ago when I took this Editor position of *Metaleptea*. The newsletter started in 1978 and, throughout its 36 years of history, it has gone through several editorships and evolved over time. When I took over in 2009, *Metaleptea* was already excellent in format, thanks to my predecessor Marianne Niedzlek-Feaver. But, I wanted to change things a bit, and in the first issue that I edited (vol. 29[2]), I completely redesigned the look of the newsletter. From 2010, I started to publish three issues per year, and somehow I've managed to do so every year since then. Under my editorship, *Metaleptea* has steadily become modernized and added different functionalities such as interactive links and optimized web-viewing. In the current issue, I am happy to report that we have reached another milestone. Now, *Metaleptea* officially has an ISSN number. With this new change, I fully expect that our readership will further increase and the newsletter will become even more appealing to our members who are considering contribution.

As usual, this issue is full of interesting articles. We have regional reports from many parts of the world, as well as OS grant reports from several students. I would like to thank all those who have contributed to this issue. I would also like to thank our associate editor, Derek A. Woller, for his continuous assistance in the editorial process.

Metaleptea is an excellent outlet to communicate to our members around the world. There is no limit on what we can publish: articles, stories, photos, artwork, etc. However, specifically I would like to solicit the following types of contributions for all future issues:

- Collecting travelogues
- Museum visit travelogues

- Interesting observations
- Highlights of your peer-reviewed publications
- Wish lists
- Photography techniques
- Collecting techniques
- Personal stories

I would be particularly keen to receive personal stories. Stories about other orthopterists, exciting collecting events, or some wild stories. Remember that *Metaleptea* is completely dependant on member contributions!

To be published in *Metaleptea*, please send me articles, photographs, or anything related to orthopteroid insects at song@ucf.edu with a subject line starting with [Metaleptea]. As

for the format, a MS Word document is preferred and images should be in JPEG or TIFF format with a resolution of at least 144 DPI. The next issue of *Metaleptea* will be published in September, 2014, so please send me content promptly. Also, please do not hesitate to send me feedback regarding *Metaleptea*. I look forward to hearing from you soon!

Officers of the Orthopterists' Society

President: Michael Samways, Department of Conservation Ecology & Entomology, Stellenbosch University, Matieland, South Africa. samways@sun.ac.za

President-Elect: Alexandre Latchininsky, Department of Ecosystem Science and Management, University of Wyoming, Laramie, WY, USA. latchini@uwyo.edu

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Managing Editor JOR: Sam Heads, Illinois Natural History Survey, University of Illinois at Urbana-Champaign, Champaign, IL, USA. swheads@illinois.edu

Editorial Assistant JOR: Nancy Morris, Department of Biology, University of Toronto at Mississauga, Mississauga, ON, Canada. jor@utm.utoronto.ca

Manager Orthopterists' Society Website: Piotr Naskrecki, Museum of Comparative Zoology, Harvard University, Cambridge, MA, USA. pnaskrecki@oeb.harvard.edu

Associate Manager OS Website: David C.F. Rentz, 19 Butler Dr., Kuranda, Queensland, Australia. orthopl@tpg.com.au

Editor Metaleptea: Hojun Song, Department of Biology, University of Central Florida, Orlando, FL, USA. song@ucf.edu

Associate Editor Metaleptea: Derek A. Woller, Department of Biology, University of Central Florida, Orlando, FL, USA. asilid@gmail.com

Orthoptera Species File Officer: María Marta Cigliano, División Entomología, Museo de La Plata, Universidad Nacional de la Plata, La Plata, Argentina. cigliano@fcnym.unlp.edu.ar

The Ted Cohn Research Fund Manager: Michel Lecoq, CIRAD, France. lecoq@cirad.fr