METALEPTEA

THE NEWSLETTER OF THE ORTHOPTERISTS' SOCIETY

President's Message

By MARIA MARTA CIGLIANO
President

Dear Society Members,

This is a special year for our Society, since it is the year when we have the opportunity to gather during our ***11th International Congress of Orthopterology*** that will take place in Kunming, China, from 11 to 15 of August. Prof. Long Zhang and the Local Organizing Committee are working hard towards the organization of the meeting and I am confident that they will organize a wonderful Congress in an extremely interesting region of China. There is an exciting scientific program including cutting edge topics of Orthopterology presented in Plenary Conferences and Symposia, oral and poster sessions.

For more information on the Plenary Conferences and Symposia Program, please read the 3rd announcement of the Congress included in this issue or visit the Congress Website at: http://ico.greatlocust.com

Membership dues payments

The Society had to give up credit card processing through merchant services because of the high costs. Thus, Pamm Mihm, who has been helping David Eades with the treasurer work, was able to run credit cards through Paypal. However, she is having trouble trying to run non-USA credit cards through Paypal, since Paypal's directions change to the language of the country you enter in the address, and sometimes a message pops up in the foreign language indicating why the credit card is not going through which she cannot read. In order to avoid this kind of problems we would like to ask to our non-USA members to please use Paypal for your payment. This is a secure, easy and fast online way for payments. Besides, there is no need to set up a Paypal account; members can make a one-time payment.

For those members who still prefer to send their payments by post mail, please do send them to the following name and address: David Eades, 2417 Fields South Drive, Champaign, IL 61822, USA

As usual, feel free to contact me (cigliano@fcnym.unlp.edu.ar) and send me your comments, ideas and suggestions for improving the Society, and how we may better serve our members.

I look forward to seeing you all in Kunming.

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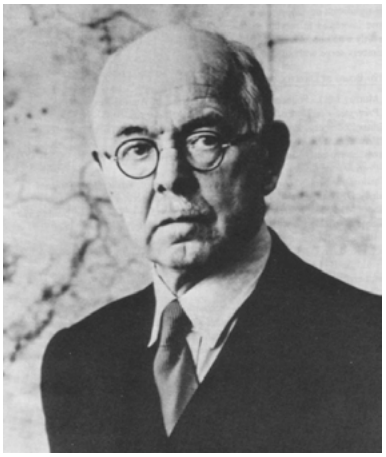
Call for Award Nominations

D.C.F. Rentz Award

The Orthopterists' Society is pleased to call for nominations for the **"D.C.F. Rentz Award"** to be presented at the 11th International Congress of Orthopterology that will be held in Kunming, China, August 11-15, 2013. The award is intended to recognize the outstanding contributions of the nominee has made to Orthoptera research, particularly the work of retired or emeritus orthopterists who have devoted their entire lives to the study of Orthoptera. Complete applications should consist of a letter of nomination with a brief description of the accomplishments of the proposed candidate, and one or two letters of support. The OS Executive Board will choose among the nominees, and the awardees will be presented a personalized award certificate to reflect the nature of their contributions to Orthopterology during the gala dinner in Kunming.

Proposals should be sent to Maria Marta Cigliano (cigliano@fcnym.unlp.edu.ar) by June 15, 2013.

Sir Boris Uvarov's Award in Applied Acridology



General status

The award bears the name of the Father of Modern Acridology, the famous Russian-English orthopterist Boris Petrovich Uvarov (1888 – 1970). This award, sponsored by the Association for Applied Acridology International (AAAI), and administered by the Orthopterists' Society, recognizes outstanding contributions which have a direct impact on both, the theory and practice of locust and/or grasshopper management.

The award consists of:

- An amount that varies depending upon the interest earned from the endowment
- An inscribed plaque
- A certificate

The award will be presented at the 11th International Congress of Orthopterology, the next Orthopterists' Society International Meeting; however, the award will not provide any financial support for the recipient to attend the meeting. A short bio of the award recipient will be published in the newsletter of the Society, *Metaleptea*.

Nomination Requirements

Nominations may be submitted by any person and/or organization. Membership in the Orthopterists' Society is not required. Self-nominations are accepted. Previous recipients of this award are not eligible for future nominations. Any candidate nominated, but not selected, is eligible for re-nomination(s).

Nomination packages must include a CV of the nominee (10 size font, 5 pages maximum, including publications) and a letter of recommendation specifically stating the nominee's:

- Significant contributions to the theory of locust and/or grasshopper management in the form of publications, research grants, student advising, and presentations at national and international scientific forums;
- Evidence of major impact into the practice of locust and/or grasshopper management at national or international level.

Electronic Submission Requirements
All nomination packages must be submitted electronically (paper nominations will not be accepted). Acceptable file formats include: DOC, RTF, and PDF.

Deadline

Application/nomination packages must be received by the Executive Director of the Association for Applied Acridology International, Dr. Alexandre Latchininsky (Latchini@uwyo.edu), before June 1st, 2013, who will confirm receipt of nomination packages, and also notify nominators of any problems with nomination package files within a week after the deadline.

Evaluation procedures

Nominees/candidates will be judged by an award panel consisting of three Orthopterists' Society members with international expertise in both theoretical and practical locust and/or grasshopper management plus two previous recipients of the award.

The panel will be selected by the Executive Board of the Orthopterists' Society.

Notification

The President of the Orthopterists' Society will notify all candidates and their nominators, where applicable, with the results of their application approximately one month after the application/nomination submission deadline.

Molecular Evolutionary Genetic Studies of Orthopteroid Insects: A Bibliography

By **WILLIAM CHAPCO**
Professor Emeritus
Department of Biology
University of Regina

Since my last review of this topic (Chapco 1997), there has been a virtual explosion in the number of population genetics studies and phylogenetic analyses of grasshoppers, katydids and their kin in which molecular markers (e.g. RAPDs, AFLPs, microsatellites, partial mitochondrial and nuclear sequences and, more recently, complete genomic sequences) have been used as traits. To perform an up-to-date review at this time would be a somewhat daunting task. Instead, I am providing a list of references that have appeared since 1997 and which may prove useful to other researchers.

The style I've chosen more or less follows that set out by the *Journal of Orthoptera Research*. Some references, strictly speaking, are not molecular in scope but ones in which comparisons with molecular phylogenetic findings are made (e.g. Cigliano and Amédégnato 2010). Others deal with molecular aspects of development (e.g. Dearden and Akam 2000), which, it is expected, will have phylogenetic implications in the future.

I hope to regularly update this list and, therefore, if anyone has noticed references that should have been included, or has recently published an article on the topic, please let me know (chapco@uregina.ca). Thank you.

To view the references, please follow the link within:

http://www.uregina.ca/science/biology/people/professors-emeriti/william-chapco/index.html

Regional Reports - What's happening around the world?

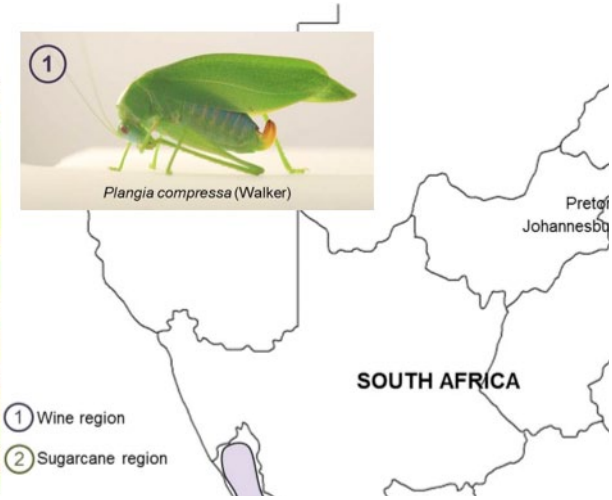
Southern and Eastern Africa

By **CORINNA S. BAZELET**
Stellenbosch University,
Department of Conservation Ecology and Entomology,
South Africa

Simultaneous outbreaks of orthopteran pest complexes in South Africa

Orthopteran outbreaks in South Africa rarely reach economic proportions. As in other places across the globe, sporadic outbreaks are recorded every year of species ranging from Pyrgomorphidae (e.g. *Phymateus viridipes* Stål in 2008) to Gryllidae (e.g. *Gryllus bimaculatus* De Geer in 2005), but these usually pass quickly and cause minimal damage. Three of the four plague locust species which are known to occur in South Africa – Migratory Locust, Desert Locust and Red Locust – rarely, if ever, reach outbreak proportions in this region. The Brown Locust, *Locustana pardalina* (Walker), is the only locust whose principal outbreak area is in South Africa, in the sparsely populated Nama Karoo semi-desert. This species reaches near-outbreak proportions annually, but its outbreak region is used mainly for livestock grazing and not crop production, minimizing the locusts' economic impact.

In 2012, however, two orthopteran outbreaks caused economic damage to crops to the extent where agricultural research institutions put out competitive calls for research funding to study the problem species: a katydid out-



break in the wine-producing region on South Africa's west coast, and a grasshopper outbreak in the sugarcane-producing region on the east coast. In both cases, which are geographically separated by almost 1500 km and involve vastly different crop and pest systems, the orthopteran outbreaks consist of multi-species assemblages. Dr. Pia Addison, from Stellenbosch University's Department of Conservation Ecology and Entomology, is now leading master's projects to study both pest systems.

South Africa's wine-producing region is in the fynbos biome, a biodiversity hotspot renowned for its floristic richness. This region is classified as a Mediterranean-type ecosystem and has winter rainfall and temperate climate. Wine has been produced continuously in the region since the late 17th century. Wine growers have long recognized the sporadic presence of katydids on their vineyards, but starting in late 2011 they observed a substantial increase in population size. The katydid pest complex consists of *Plangia graminea* (Serville; Phaneropterinae) and *Plangia compressa* (Walker; Phaneropterinae). The distribution of *P. compressa* is restricted to South Africa, while *P. graminea* occurs across Africa, although its species status has recently been called into question (Hemp, 2013). Dr. Addison, together with Prof. John Terblanche, Paul Grant, M.Sc. student Marce Doubell, and funding from Winetech, embarked on a project in February 2013 to determine the distribution and seasonal cycles of the katydids. Clues regarding the life history of the pest assemblage can help to design targeted management programs and reduce the need for harmful pesticides.

Sugarcane, on the other hand, is grown on the subtropical Indian Ocean coast of South Africa. This region experiences much higher rainfall, concentrated mostly during the summer months, and the climate is hot and humid. Grasshopper outbreaks in sugarcane are localized to a particular region of KwaZulu-Natal Province and seemingly recur on the same farms year after year, despite no apparent differences in management or natural environment between the afflicted farms and their neighbors. The most common species in the pest assemblages are *Petamella prosternalis* (Karny; Tropidopolinae), *Cataloipus zuluensis* (Sjostedt; Eyprepocnemidinae), and *Cyrtacanthacris aeruginosa* (Stoll; Cyrtacanthacridinae). Worryingly, increasing numbers of Red Locust, *Nomadacris septemfasciata* (Serville; Cyrtacanthacridinae) are also being found as the study progresses, including occasional detection of gregarious nymphs. Dr. Des Conlong of the South African Sugarcane Research Institute and Dr. Addison are co-supervising Adrian Bam in a M.Sc. project to investigate the composition, seasonality and life history of the pest assemblages to elucidate possible biotic and abiotic factors which may explain these outbreaks and to help in the development of integrated pest management techniques.

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North Africa & Sahel

By MOHAMED ABDELLAHI OULD BABAH EBBE
Centre de Lutte Antiacridienne
Mauritania

Mauritanian Research-Days and Scientific Exchange on Biology and Environment

Between 12 and 13 December 2012, "Research-Days and Scientific Exchange" was organized by ISET (High Institute for Technological Studies, Institut Superieur des Etudes Technologiques) in collaboration with Direction of Research in the Ministry of Superior Education and Research, Faculty of Science and Technology, National Anti-Locust Center (CNLA) and with financial support from CNLA, National Office of Medicine Labor (ONMT) and National Center of Agronomic Research (CNRADA).

The main objective of this event was to know the progress of research at the national level and to exchange scientific research regarding topics such as Plant Genetic Resources, Genetic Resources and Health and Environment. This would help the participants to develop a proper management and conservation of natural resources, while respecting the environment, and optimizing results of research on biodiversity and health. In the meantime, Mauritanian Association in Biological Sciences was created and temporary election offices to prepare rules and status were prepared by a restricted committee.

Official ceremony. The Minister of Undergraduate, Postgraduate Education, and Scientific Research, accompanied by the Deputy Governor and the Director of ISET, officially headed the official opening ceremony.

Scientific commission. A scientific commission composed by the Faculty of Science and Technology (Biology Department), ISET, CNLA, Ecole Normale Superieure (ENS), Institut National de recherché de santé Publique (INRSP), Parc National du Banc d'Arguin (PNBA), Office National de Medecine de travail (ONMT), Office d'Inspection Sanitaire des Produits de

la Pêche et de l'Aquaculture (ONISPA) have contributed to the preparation and management of the evnt. At the end of Research-Days, a field visit was organized by ISET in their experimental rice farm and laboratories.

CNLA Research contribution on Orthoptera. The CNLA contributed five communications by its researchers. The first communication was presented by Sidi Ould Ely on the significance of applied research related in locust control, which led to a better understanding of the Desert Locust in the environment. This research has also improved implementation of the preventive strategy and use the Green Muscle in locust control (through the Green Teams). Many students enrolled in Master's and PhD were also involved in this research.

The second communication was presented by Sid'Ahmed Ould Mohamed about the plan of CNLA to set up a joint research unit in acridology, in collaboration with several national, regional and international partners (CIRAD, University of Louvain, JIRCAS, …). The establishment of this unit should enhance the expertise in acridology available in Mauritania, around a sustainable scientific projects of common interest; and to develop a high research level. This joint research unit will be composed initially of five co-founding institutes in order to work together around relevant research priorities. This

research unit is willing to collaborate with any national, regional or international partners.

The third communication was presented by Dr. Koutaro Ould MAENO (Japanese researcher at JIRCAS/CNLA) on the mechanism of phase polyphenism and the process of gregarization linked with locust outbreaks. Understanding the real ecological aspects of the locust in nature is essential since this organism is sensitive to its population density and surroundings. We have found that solitarious nymphs have a feeding preference for particular plant species during certain development periods of the nymphal stages, and that they show a series of curious behaviors at night.

The fourth communication was presented by Mohamed El Hacen Ould Jaavar about importance of Desert Locust habitats, in the implementation of preventive control strategy using RAMSES (CNLA dBase). Observation probability maps of grassland plant communities and perennial on monthly and quarterly basis were established. The affinities of the various Desert Locust phase stages (solitarious, gregarious, and transient) with various parameters including flora (plants, plant cover), habitat and geomorphology were described and summarized. The results can contribute to the rationalization of the spatio-temporal strategy locust monitoring in Mauritania.

The last communication was presented by Sidi Ould Ely on population dynamics of the locust *Schistocerca gregaria* in Mauritania by using morphometric measurements during locust six consecutive seasons. Locusts collected showed a significant predominance of solitarious forms among three locust seasons (2007-2010), despite the high densities of populations occurred during the 2008-2009 and 2009-2010 seasons. The results suggesting that the gregarisation probably occurred from populations at low densities unlike in the 2006-2007 season when most insects were collected with morphometric characters typically categorized as transient. The first two sampling sites during the current resurgence (2012-2013) showed typical gregarious-transiens populations.

East Europe – North and Central Asia

By MICHAEL G. SERGEEV
Novosibirsk State University
and Institute of Systematics
and Ecology of Animals
Russia

The region of East Europe, North and Central Asia occupies almost half of Eurasia. This territory is favorable for many groups of the Orthopteroid insects, especially in the southern part. There are a lot of endemic tribes, genera and species. The main centers of diversity are situated in the mountains of the North Caucasus, Tien Shan, the Pamiro-Allay, and in the Far East. Some new taxa will be described soon.

Unfortunately, the number of orthopterists is limited and is not enough to solve all of the problems in fundamental and applied orthopterology of the region. Almost all researchers are in Russia (mainly in Novosibirsk, Saint-Petersburg, and Moscow). However, some orthopterists work in the other parts of Russia (Kazan, Borisoglebsk (Voronezh Region), Nalchik, Gorno-Altaisk,Vladivostok etc.), in Bulgaria, Hungary, Kazakhstan (Almaty), Poland, Romania, Slovakia, and Uzbekistan. Among them are several young researchers who are preparing for their PhD dissertations or have just finished them.

Bryodema (Bryodemella) holdereri Krauss, 1901 is distributed in the dry steppes and semi-deserts of the Altay and Sayan Mts, Mongolia, N, NE China. (Photo credit: M.G. Sergeev)

There are two main problems limiting the relationships between the local orthopterists and the Orthopterists' Society. The first of them is the linguistic one. This is especially important for preparation of articles for international journals, for some preparations of international grant applications, for attending congresses and conferences. Another problem is strong financial limitations. The level of financial support of research activity is relatively low in all FSU countries. However, during last decades we have been able to get some additional financial support from different sources, international and national. For example, in Russia, orthopterological studies are supported by different agencies (Russian Foundation for Basic Research, State Program for Science Development etc.). In some cases, orthopterists have run into some problems with communications, because mailed messages (including the electronic ones) may be delayed or missed.

Isophya altaica Bey-Bienko, 1926. The endemic of the Altay Mts. Its range is relatively far from the main range of the genus *Isophya* (Europe, Asia Minor, the Caucasus). (Photo credit: M.G. Sergeev)

We discussed the situation on the special informal meetings of orthopterists during the last Congress of the Russian Entomological Society in Saint-Petersburg in 2012. Several participants of this meeting from Moscow, Petersburg, Novosibirsk, and Nalchik tried to develop some ideas concerning cooperation between different groups of researchers and among the orthopterists from the FSU and international orthopterological community.

These discussions partly resulted in several projects supported by the Russian Foundation for Basic Research and some other foundation. For instance, one of them includes orthopterists from Russia (Novosibirsk and Gorno-Altaisk) and China (Urumqi). The goals of the project are (1) to determine differences in distribution patterns of two related but ecologically different taxa of the Orthopteroid insects — terrestrial grasshoppers (Orthoptera, Acridoidea) and semi-aquatic stoneflies (Plecoptera) in the arid and semi-arid mountains of the inner part of Eurasia, namely Eastern Tien Shan and Altay due to ecogeographical and historical peculiarities of both areas, and (2) to evaluate trends of shifts of their distribution and changes of diversity resulted of global changes and human induced transformations of local ecosystems.

The scientists of the region continue to solve some problems of fundamental and applied orthopterology. They investigate the distribution patterns of taxa, populations, and assemblages, try to create digital maps describing these patterns, to reconstruct the phylogenetic relationships and to evaluate

the taxonomic structure of several taxa based on the synthesis of the classic (ecologo-geographic, morphological, cytogenetic) and modern (molecular/phylogeographic) approaches. Comparative studies of acoustic patterns of different taxa of Orthoptera relative to their taxonomy, phylogeny, and ecology are also continued.

In April, 2013, several orthopterists from East Europe attended the Workshop European Orthoptera in Leiden, took part in some intensive discussions concerning conservation strategies for European Orthoptera and practiced in assessing some rare species for the IUCN Red List.

During the last years, applied acridologists from Central Asia and Russia were involved in the special project of FAO, namely "Locust Watch: Locusts in Caucasus and Central Asia". The special website was developed in English and Russian (http://www.fao.org/ag/locust-CCA). The site includes different information about three main pest species of the region: the Italian, Migratory, and Moroccan locusts. The general situation with pest species was relatively serious in the different parts of Central Asia and in Russia (mainly in the North Caucasian, Lower Volga and South Ural areas). This would mean that some long-term studies should be organized and strong cooperation between acridologists of neighboring countries and territories and between fundamental and applied science should be developed anew.

Japan

By SEIJI TANAKA
National Institute of Agro-biological Sciences at Ohwashi
Japan

The Japanese branch is a small group and I have received news from only a few members. Dr. Kouichi Moroi, an amateur entomologist, witnessed a female adult of *Teleogryllus emma* at a platform of Tokyo station and wondered where she came from. This species has a short period of migratory flight after adult emergence and his observation confirms that it is a strong flyer.

Dr. Haruki Tatsuta (Ryukyu University) and his colleagues are working on clarifying phylogenetic relationships and evolutionary process of genital shapes of a phasmid, *Entoria okinawaensis* and closely related species. They are also studying a mechanism of chromosomal rearrangements and genetic population structures in some *Podisma* species.

Dr. Seiji Tanaka (National Institute of Agro-biological Sciences at Ohwashi) is retired and started working as a part-time scientist at the same institute. He is working on phase polyphenism in locusts and seasonal life-cycle adaptation in crickets and others.

Mermithid parasite (Nematoda: Mermithida, Mermithidae) of katydids (Orthoptera: Tettigoniidae) in Kazakhstan

By IZBASAR TEMRESHEV
MURATBEK CHILDEBAEV
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Institute of Zoology
Ministry of Education and Science
Republic of Kazakhstan, Kazakhstan

Nematodes of the family Mermithidae parasitize arthropods, mostly insects, as well as arachnids and crustaceans. Some species infect round worms and mollusks. They are usually specific to just one type of host (or one or two families), causing its death in the course of development. Nematodes either completely devour the host from the inside, leaving only an empty exoskeleton, or cause parasitic castration, inhibit molting and produce other damages to insects (Rubtsov, 1978). Mermithidae as a group are of ancient origin – they were found in spiders from the Baltic amber aged 40 million years old (Poinar, 2000).

The following description of mermithid biology is based on publications of Rubtsov (1978) and Baker and Capinera (1997). *Mermis* spp. females display the curious habit of depositing their eggs on vegetation, where they are accidentally ingested by herbivorous insects; other mermithids lay their eggs in the soil

Fig. 1. *Glyphonotus alactaga, female, Mermithidae katydid*

Fig. 2. *Glyphonotus coniciplicus,* female, Mermithidae katydid

and when they hatch the larvae move to the surface and penetrate the hosts. After ingestion, the *M. nigrescens* eggs quickly hatch and the immature nematodes break through the gut wall and enter the body cavity of the host insect. Infection by *M. nigrescens* inhibits development of the ovaries in grasshoppers, and the host may perish before or after the nematodes emerge from the insect. After emerging, the nematodes enter the soil where they reach the adult stage after 2-4 months. They are not sexually mature for another 6 months, and may remain in the soil for up to 3 years, though a two-year life cycle is normal. *M. nigrescens* may either mate, or reproduce parthenogenetically. Males are not as long-lived as the females. Males are about 40-60 mm long, females 60 to 160 mm. Females produce large quantities of eggs, estimated to be up to 14,000 per female. Irrigation can increase parasitism of grasshoppers by these nematodes by simulating rainfall conditions; rainfall is a prerequisite for adult female nematodes to leave the soil to deposit eggs.

Many species of mermithids have potential as agents of biological control of pests and vectors of infectious diseases attacking harmful Orthoptera, Lepidoptera, Coleoptera and Diptera. Currently, biological insecticides based on entomopathogenic nematodes are being developed against arthropod pests in many countries of the world, such as Nemabakt, Entonem-F etc. Among Orthoptera, the list of Mermithidae hosts includes katydids *Tettigonia caudata* (Charpentier), *T. viridissima* L., *Platycleis intermedia* (Audinet-Serville), *Tessellana vittata* (Charpentier) (Sandner, 1974; Zemlyanskaya, Lysikova, 1979; Rubtsov, 1979; Danilova, Karpov, 1990; Baker, Capinera, 1997; Sambeek, Wiesner, 1999; Shternshis, Tsvetkova, 2002), Desert locust *Schistocerca gregaria* (Forskål) (Craig and Webster, 1974), Asian locust *Locusta migratoria* L. (Allal-Benfekih, 2006), Moroccan locust *Dociostaurus maroccanus* (Thunberg) (Hernandez-Crespo and Santiago-Alvarez, 1997; Quesada-Moraga and Santiago-Alvarez, 2000), grasshoppers *Arcyptera microptera* (Fischer de Widhelm) (Zemlyanskaya, Lysikova, 1979), as well as many American grasshoppers of the genus *Melanoplus* Stål and *Hesperotettix viridis* (Thomas) (De Bach, 1968). One of the species of nematodes which often affects Orthoptera is *Mermis nigrescens* Dujardin. This is one of the most widespread Mermithidae species attacking a wide range of hosts. Its distribution range covers North and South America, Europe, Asia, and parts of Africa. Also, this nematode was found on Tasmania, although not in Australia. Typically, it is associated with Orthoptera (Acrididae, Romaleidae, Tettigoniidae), but may also attack earwigs, beetles, butterflies and even Hymenoptera (bees). Some specialists showed that annually, this mermithid infects on the average 17% of North American grasshoppers (Denner, 1970) although there are documented cases of infection rates in *Melanoplus* spp. reaching 76% (Burges, Hussey, 1979; Baker, Capinera, 1997).

In 2012 we documented emergence of mermithids from 2 katydid species of the genus *Glyphonotus*, *G. coniciplicus* Uvarov and *G. alactaga* Miram (Figures 1-2). Also, we found the same mermithid infecting a protected katydid species from the Red Book of Kazakhstan, *Ceraeocercus fuscipennis fuscipennis* Uvarov (Figure 3). The infections of these katydid species by Mermithidae have never been recorded.

Material: South Kazakhstan area, Karatau mounts, floodplain, Ikansu river, N 43°30'50.3 "/ E 68°46'48.8", 735 m, 24.06.2011, Childebaev, Temreshev, Kolov, in the body cavity of grasshoppers *Glyphonotus*, 3 ex.; 25.06.2011, Childebaev, Temreshev, Kolov, in the body cavity of grasshoppers

Fig.3. *Ceraeocercus fuscipennis,* female

Glyphonotus, 3 ex.; 25.06.2011, Temreshev, water, coming out of grasshoppers *C. fuscipennis*, 2 ex.; South Kazakhstan area, Karatau mounts, floodplain, Hantagy gorge, N 43° 33'32 .4 "/ E 68° 40'52 .7", 570 m, 26.05.2011, Childebaev, Temreshev, Kolov, in the body cavity of grasshoppers *Glyphonotus*, 4 ex. Percentage of infected population reached 0.08 % for *G. coniciplicus*, 15% for *G. alactaga* and 50 % for *C. fuscipennis* in the floodplain, Ikansu river, 24 % for *G. coniciplicus* and 0.08% for *G. alactaga* in the floodplain, Hantagy gorge.

According to our observations, Mermithidae extracted from the body cavity of grasshoppers were of a very light coloration. However, when they emerged from the hosts their color was rather dark. In this characteristic they resemble the above-mentioned M. nigrescens, or a species close to it, probably a new species. It may be promising as a biological agent of control for locust infestations. On the other hand, we recorded cases when it killed a rare species of Orthoptera listed in the Red Book of Kazakhstan, such as *C. f. fuscipennis*. As such, the identification and further clarification of the host range of this mermithid deserves a careful study.

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The Rancher's Worry

By DOUGLAS SMITH
Ecosystem Science and Management
University of Wyoming

We are growing cattle not grasshoppers
Though some years it seems the other way round
All those pest experts, rangeland managers
Telling us again hoppers will abound

With beef at one seventy at the market
I don't think a hopper leg; fried, sautéed
Stuffed, steamed, or otherwise will cut it
Bunch to sell but no USDA grade

Late June with Angus calves in the pasture
Snow is gone, rain has come, grass has grown tall
Hoping that this crop makes it the best year
And praying those hoppers don't eat it all

Thank the Lord for those who know these pests
Delivering us from *Melanoplus*

Alexandre Yersin and the serendipitous stick insect

By JOHN HOLLIER
Muséum d'histoire naturelle de Genève
Switzerland

Figure 1. Portrait of the older Alexandre Yersin (from Saussure, 1866).

Alexandre Yersin (1825-1863) was born in in the humblest of circumstances in the small town of Morges in the Swiss canton of Vaud. His father is unknown, and he took his mother's surname. His mother supported his education by doing manual work, and conscious of her sacrifices he repaid her by his diligence and achievements (Forel, 1864). The young Yersin gained a place at the Academy of Geneva, where he studied under Auguste de la Rive and François-Jules Pictet, and showed great talent for science. At that time this was no small achievement for a poor boy without patronage, but Yersin's ambitions went much further.

Taking a job as a teacher, first at Aubonne and then in his native Morges, Yersin devoted all of his spare time to research, focusing particularly on the Orthoptera. He collected specimens locally, further afield in the Alps and on excursions to southern France and northern Italy, as well as obtaining specimens from various correspondents. Forel (1864) relates that Yersin had extensive contact with Brisout [de Barneville], Perris, Dufour and Mulsant in France, Ghiliani in Italy, Fischer and Brunner [von Wattenwyl] in Germany (the latter was actually in Austria) and Imhoff, Meyer [Dür] and Saussure in Switzerland. Saussure (1866) adds Lucas and Fieber to this list of eminent correspondents. Both list 24 publications by Yersin (some with coauthors).

Yersin described twelve new species of Orthoptera, one of Dermaptera and one of Mantodea, most of the type specimens of which are now in the Muséum d'histoire naturelle de Genève (Hollier, 2007). Perhaps more important for his reputation amongst his contemporaries were his studies of stridulation, the development of the wings and of the functioning of the nervous system, each based on minute observation and experimentation with live subjects.

Excessive study took its toll on Yersin's health, and he had to give up teaching. He obtained the post of superintendent at the state gunpowder factory at La Vaux near Aubonne, which provided a reasonable salary and included an official residence suitable for his young family. Here he worked with his characteristic diligence, applying his knowledge of chemistry and mechanics to the improvement of the production process, whilst continuing his private research. After some 20 months in this post he died suddenly and unexpectedly, at the age of only 38.

The esteem in which Yersin was held is demonstrated by the extensive obituaries by Alexis Forel and Henri de Saussure. The former (the great-uncle of the famous ant expert Auguste Forel) lived in Morges, and published at least three papers on the Auchenorrhyncha. Yersin provided Forel with specimens, and was also

Figure 2. Syntype of *Ephippiger provincalis* Yersin, 1854.

Figure 3. Portrait of the younger Alexandre Yersin.

responsible for the plates which accompanied some of Forel's publications (Hollier, 2006). Henri de Saussure wrote his appreciation of Yersin and his work whilst president of the Swiss Entomological Society. Saussure was also one of Pictet's former pupils, and had made an expedition to Mexico and the Caribbean before joining the commission running the Geneva Museum (Hollier & Hollier, 2012). It was Saussure who arranged that the Museum should acquire Yersin's collection. Saussure had already dedicated a grasshopper species he had collected on his Mexico expedition to Yersin, *Phalaca yersini* (Saussure, 1859). Yersin's friend Brisout de Barneville had also dedicated a species to him; the earwig *Forficula yersini* Brisout de Barneville, 1856 (a junior synonym of *Gaunchia pubescens* (Géné, 1837)). As Forel (1864) noted, in an age when scientific endeavour was essentially the preserve of the wealthy, the remarkable scientific achievements of Yersin and his acceptance by his peers represent an extraordinary triumph of talent and dedication.

Other taxa were named for Yersin after his death. Saussure described the cricket *Arachnocephalus yersini* Saussure, 1877 (a junior synonym of *Arachnocephalus vestitus* Costa, 1855) from specimens collected by Yersin in the south of France. Brunner von Wattenwyl recognised that the grasshopper which Yersin had described as the unknown male of *Porthetis raulinii* (Lucas, 1854) was a distinct species and named it *Orchamus yersini* (Brunner von Wattenwyl, 1882). He also dedicated the bush cricket *Barbitistes yersini* Brunner von Wattenwyl, 1878 to Yersin. More recently Ramme described the bush cricket genus *Yersinella* Ramme, 1933 to contain Y. ramondi (Yersin, 1860), and Harz named a subspecies of the grasshopper *Chorthippus raymondi* (Yersin, 1863) after him, now raised to species rank as *Chorthippus* (*Glyptobothrus*) *yersini* Harz, 1975. Saussure dedicated a cockroach species from his Mexico expedition to Yersin; *Epilampris yersiniana* Saussure, 1864. In the Mantodea, the genera *Yersinia* Saussure, 1869, *Pseudoyersinia* Kirby, 1904 (erected to contain *P. brevipennis* (Yersin, 1860)) and *Yersiniops* Hebard, 1931 commemorate his labours.

Yersin left a wife and three children, one of them born in 1863 shortly after his death. His widow moved back to Morges and supported the family by running a girl's school. The youngest child was, rather confusingly, named Alexandre, and from a background nearly as unpromising as his father's he went on to become much more famous (Service des Archives de l'Institute Pasteur, 2013). The younger Yersin studied medicine at the universities of Lausanne (the capital of Vaud), Marburg and Paris, and then worked in Louis Pasteur's laboratory on an anti-rabies serum. After working with Koch in Berlin he returned to Paris to work in the new Pasteur Institute, where he researched diphtheria bacillus. To be authorised to practice medicine in France Yersin took French nationality 1888. In 1890 he joined the Messageries Maritimes shipping company and was posted to French Indochina as company physician. While there, he used his leave to explore the hinterland, and continued to work in association with the Pasteur Institute making his most famous contribution to medicine by

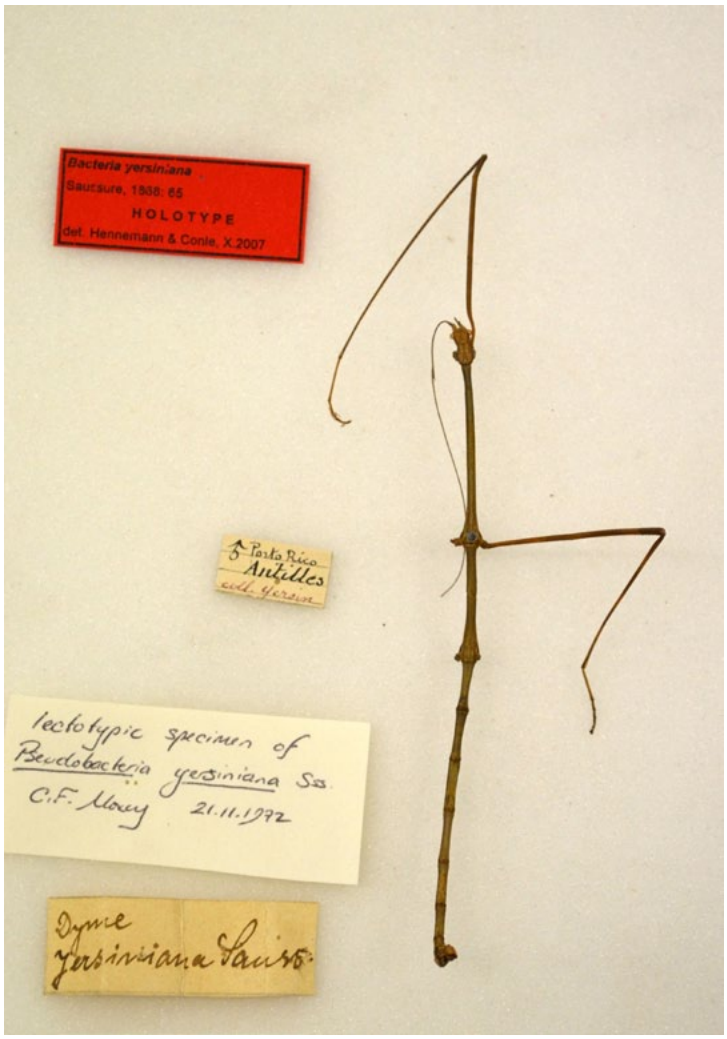

Figure 4. Holotype of *Bacteria yersiniana* Saussure, 1868.

isolating the pathogen responsible for the plague, which was named *Yersinia pestis* in his honour. Yersin also demonstrated that the same bacillus was present in rodents, suggesting a means of transmission. After another period at the Pasteur Institute in Paris, Alexandre Yersin returned to French Indochina and helped establish the first medical school in Hanoi and the Indochina Pasteur Institute at Nha Trang. Yersin also experimented with agriculture and was a pioneer in the cultivation of rubber trees and quinine in the region. He died in Nha Trang in 1943 at the age of 79, and is still remembered as a benefactor of Vietnam, with streets, schools and even a university bearing his name.

By one of those strange coincidences, Saussure had, long before, named a Caribbean stick insect from the older Alexandre Yersin's collection *Bacteria yersiniana* Saussure, 1868. The genus name is a complete coincidence of course, but a rather amusing prophecy with respect to the younger Alexandre Yersin's career.

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Editorial

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

It is hard to believe that it's already May. Here in Florida, the weather is getting hotter everyday, and there are grasshoppers everywhere!

This issue is filled with interesting articles and regional reports and I thank all those who have contributed to this issue. We have an addendum to this issue, which is the third announcement for our 11th International Congress of Orthopterology in China. It's going to be a very exciting meeting and I hope many of you can participate.

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]. 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 in September 2013, so 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.

Officers of the Orthopterists' Society

Third Announcement

11th International Congress of Orthopterology

11th-15th Aug, 2013, Kunming, China

Organized by:
The Orthopterists' Society

Co-organized by:
China Agricultural University (CAU)

Yunnan Academy of Agricultural Sciences（YAAS）

Yunnan University (YU)

Yunnan Provincial Society of Microbiology (YSM)

Yunnan Provincial Society of Entomology (YSE)

Sponsors:

Ministry of Agriculture of China, P. R. China
Special Fund for Agro-scientific Research in the Public Interest (200903021)
Beijing Lifeline Biotechnology Limited Company

Important dates

- 10th July 2013: Deadline for submission of abstracts
- 10th August 2013: Deadline for online registration
- 11-15 August 2013: Kunming International Congress of Orthopterology

Web site: http://ico.greatlocust.com

Dear Orthopterists:

It is our pleasure to send you the Third Announcement of the XIth International Congress of the Orthopterists´ Society that will be held in Kunming, Yunnan, China, during 11 to 15 August, 2013.

The meeting will be held in the Hotel of Yunnan University, situated at the campus of the University.

The theme of this congress is "Orthoptera in Scientific Progress and Human Culture". We are planning an exciting scientific program to share ideas and the latest findings in the various fields of Orthopterology, and to explore fundamental scientific research regarding all aspects of the biology of these insects, from ecology and taxonomy to physiology, phylogeny, genomics, biogeography, phylogeography, behavior, and management of locusts and grasshoppers.

Kunming, the capital city of Yunnan Province in the South of China, is in the centre of the Yunnan-Guizhou Plateau, located at an elevation of 1,900 m above sea level. Yunnan has some of the most magical and diverse scenery in all of China, and is home to a third of China´s ethnic minorities. The province is also home to the nation's greatest number of species of flora and fauna. It is known for its mild climate year-round. Do plan to stay a few extra days to explore other sites in Yunnan during the post-conference tour that will be organized to Dali, Lijiang, and Shangri-La. Please visit the Congress website (http://ico.greatlocust.com) for information on the Post-Conference tour.

We look forward to seeing you in Kunming, and offering you an informative conference and a warm Chinese experience.

Sincerely yours,

Long Zhang and María Marta Cigliano

Plenary Conferences and Symposia Program

Plenary conferences:

Opening Ceremony

Plenary Lecture 1:

Speaker: Axel Hochkirch, Trier University Germany.

Topic: Orthoptera Conservation in the 21st Century - Where do we go from here?

Closing Ceremony

Plenary Lecture 2:

Speaker: Le Kang, Chinese Academy of Science, China

Symposia program:

1. Orthoptera Conservation

Organizer: Michael Samways
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Co-organizer: Shuguang Hao,
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Introduction:

Life on Earth is facing an extinction crisis, where estimates suggest that possibly a third of all insect species may go extinct. These extinctions are mainly caused by humans, either directly through activities such as landscape change or indirectly through agents such as global climate change. Many of these impacts operate synergistically, which then increases the threats to species, and indeed to whole ecosystems. Orthoptera are among these casualties with one, *Neduba extincta*, even scientifically described after it was extinct from human impact. Then there are many that are going extinct or are extinct, yet they have never been scientifically studied or even collected. These are known as Centinelan extinctions, and come about when swathes of natural habitat are disturbed or destroyed before any scientific investigation can take place. Yet on the positive side, there have been some very encouraging activities across the world, where orthopteran species have received special conservation action. These activities are now also being promoted through the IUCN/SSC Grasshopper Specialist Group, a globally recognized and active group of dedicated Orthoptera conservationists. This symposium addresses some of the contemporary issues and challenges facing Orthoptera conservation, with the aim of helping ensure that future generations benefit from a rich diversity of Orthoptera species.

Speakers and topics:

1. Corey Bazelet (Stellenbosch University, South Africa): *Conservation of southern African Orthoptera*

2. Corinne Watts (Land Care, Mannaaki Whenua, New Zealand): *Conservation of New Zealand*

3. Klaus Riede (Museum Alexander Koenig, Germany): *Advances in bioacoustics monitoring*

4. Marcio Bolfarini (Universidade Estadual Paulista, Brazil): *Conservation of cave crickets in Brazil*

2. Orthoptera Systematics

Organizer: Hojun Song
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Co-organizer: Yuan Huang
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Introduction:

The motivation behind this symposium is to bring together currently active orthopteran systematists and to have an opportunity to discuss about the future of orthopteran systematics. Particularly, we have invited researchers whose research focus on higher-level systematics and evolution of Orthoptera using modern phylogenetic methods.

Speakers and topics:

1. Laure Desutter-Grandcolas (Muséum national d'histoire naturelle, France): *Systematics of Grylloidea*

2. Andrej V. Gorochov (Zoological Institute of the Russian Academy of Sciences, Russia): *Systematics of Basal Ensifera*

3. Hojun Song (University of Central Florida, USA): *Phylogenetic Systematics of Orthoptera*

4. Ricardo Mariño-Pérez (University of Central Florida, USA): *Systematics of Pyrgomorphidae (Caelifera)*

5. Weian Deng (Hechi University, China): *Systematics of Tetrigidae (Orthoptera) in China*

6. Sam Heads (Illinois Natural History Survey, USA): *Fossil Orthoptera*

7. Maria Marta Cigliano (Museo de La Plata, Argentina): *Diversification patterns in Melanoplinae (Orthoptera: Acrididae) grasshoppers from the Andes highlands*

8. Jianhua Huang (Guangxi Normal University, China): *DNA barcoding and species boundary delimitation of selected species of Chinese Acridoidea (Orthoptera: Caelifera)*

3. Taxonomy of Orthoptera: How to Consider Species Concepts

Organizer: Battal Ciplak
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Co-organizer: Daochuan Zhang
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Introduction:

Species is the basic unit in taxonomy. The species to reflecting the natural entities will be functional in other areas of biology. This symposium mainly aims to outline this perspective using examples from Orthoptera. Mainly three issues will be address in symposium. (1) Definition of the natural units requires reference criteria and determination of criteria led to several species concepts. But, in application taxonomy flows in its traditional stream, thus possibly a small fraction of the named species fits to the theoretical criteria suggested by concepts. Using examples from Orthoptera we try to discuss the quality of the existing taxonomical data. (2) Different character sources are using to delimit the biological units called species. But, in several cases, conflicts between character sources are main problem in contemporary taxonomic applications. Determination of the ways of conflict and suggesting solution for application is an open area to be studied. (3) Species concepts cannot be formulated independent of speciation. Consideration of the speciation increased complexity of the reference criteria and brought new questions. Is the species or population the main unit of evolution? Was Darwin right in suggesting that there no natural units called species?... Species concepts will be discussed in these perspectives by examining speciation patterns some reference group from Orthoptera.

Speakers and topics:

1. Battal Ciplak (Department of Biology, Faculty of Science, Akdeniz University Antalya, Turkey): *Species from an integrative perspective and quality of existing taxonomical data: game of the names versus natural entities*.

2. Viviana Andrea Confalonieri (Facultad de Ciencias Exactas y Naturales. Universidad de Buenos Aires, Argentina): *High altitude grasshoppers of South America: defining biological units when genes, chromosomes and morphology tell different stories.*

3. Claudia Hemp (Coordinator KiLi research unit, University of Wuerzburg, Germany): *Ecological adaptations of grassland-inhabiting flightless Orthoptera: the subtribe Karniellina of Conocephalini (Conocephalinae, Tettigoniidae) as model group to understand modes and time of speciation patterns in East Africa*

4. Douglas W. Whitman (School of Biological Sciences, Illinois State University, USA): *Populations, not species, are the true unit of evolution.*

4. Orthoptera Sexual Behavior and Sexual Selection

Organizer: Douglas Whitman
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Co-organizer: Enbo Ma, Shanxi University, Taiyuan, China
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5. Orthoptera Communication: From Model Organisms to Comparative Studies

Organizer: Klaus Riede
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Co-organizer: Wangpeng Shi
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Introduction:

Research on Orthoptera communication can be subdivided into two major fields: in-depth studies of acoustic communication, encompassing all aspects of sender-receiver biology, and bioacoustic characterisation of songs as a taxonomic feature for species diagnosis. In-depth studies cover a wide range of research topics, from sensorial physiology of insect ears to neural processing and behavioural biology, with special emphasis on phonotaxis and sound production.due to the complex nature of experiments and equipment, this research was limited to few model organisms, such as *Gryllus* spp,, *Chorthippus* spp. and few tettigoniid species. In recent times, researchers from both ends of this spectrum were extending their approach: physiologists by studying a much wider range of species, often with a comparative approach, taxonomists by applying sophisticated bioacoustic methodology with an evolutionary perspective. This symposium will provide an overview of the state-of-the-art of this fruitful extension and fusion of research approaches.

Speakers and topics:

1. Tony Robillard, (Muséum national d'histoire naturelle Paris, France): *Integrative study of acoustic communication and evolution in crickets*

2. Eneopterinae Fernando Montealegre Zapata, (School of Life Sciences, University of Lincoln, UK): *Biomechanics of hearing and singing in Ensifera: an evolutionary view*

3. Rohini Balakrishnan, (Centre for Ecological Sciences, Indian Institute of Science, Bangalore, India): *The acoustic world of a rain forest dusk chorus*

4. Heiner Römer, (University of Graz, Austria*): Insect acoustic communication under noise:*

Lessons from the tropical rainforest

6. Grasshopper and Locust Control: Progress or Constant Renewal?

Organizer: Alexandre Latchninsky
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Co-organizer: Puyun Yang
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Introduction:

Locusts and their non-swarming "cousins" the grasshoppers (Orthoptera: Caelifera) are an essential component of temperate and tropical grassland biomes worldwide, particularly in the arid regions. At average population densities, they are beneficial for the grassland ecosystem by stimulating plant growth, facilitating nutrient cycling, and playing vital roles in food webs. However, from time to time they can produce devastating plagues and become a major threat to agriculture and food security worldwide. Their outbreaks occur on all continents except Antarctica and affect the livelihoods of 10% of the world's population. Despite the recent progress in understanding locust and grasshopper ecology and behavior, our ability to predict their dynamics and manage their populations remains insufficient, as evidenced by several outbreaks of these pests in different geographic areas in the 21st century. Furthermore, global climate changes appear to impact locusts and grasshoppers through expanding their ranges and modifying their developmental cycles, presenting new challenges for controlling these pests.

The economic importance of locusts and grasshoppers is not merely limited to direct crop and pasture damage. During outbreaks, a tremendous and costly effort is applied to control these pests. Current control strategies remain essentially curative, relying on large-scale applications of chemical insecticides to pest infestations. For example, to combat the Desert locust outbreak in 2003-2005, 13 million ha in over 20 countries on three continents were treated with broad-spectrum neurotoxins at a cost of over half a billion US dollars. Growing concerns over the environmental impacts of locust and grasshopper control programs stimulated the development of alternative approaches to population management, in particular, using biological control agents. During our symposium, the invited speakers – the renowned locust control specialists from 5 continents – will discuss the current state-of-the-art and future perspectives in locust and grasshopper control. Among others, they will address the following questions:

A. Is the paradigm shift from *curative* control to *preventive* locust and grasshopper population management realistic?
B. What are the obstacles in the adoption and practical implementation of more environmentally acceptable locust and grasshopper management strategies?
C. Sustainable locust and grasshopper management: a myth or a reality?

Speakers and topics:

1. Alexandre Latchininsky (University of Wyoming, Laramie, WY, USA):
Locust and grasshopper control worldwide*: an introduction.*

Grasshopper control: A North American Perspective

2. Annie Monard (FAO UN, Rome, Italy)： *Recent experience in large-scale locust campaigns and lessons learnt*

3. Gregory Sword (Texas A&M University, College Station, TX, USA): *Integrating the ecology of phase change and collective movement into preventative locust management*

4. Chris Adriaansen (APLC, Canberra, Australia) ： *Locust control: an Australian perspective*

5. Puyun Yang, and Jinquan Zhu (Chinese National Agricultural Technology Extension Center, Beijing China) ： *Sustainable management of locusts and grasshoppers in China*

6. David Hunter (BASF Consultant, Australia): *Are constant advances required to overcome increasing restrictions on the use of chemical pesticides?*

7. Mohamed Abdallahi Babah Ebbe (CNLA, Nouakchott, Mauritania): *Locust biological control: why it works in certain areas and does not work in others?*

8. Furkat Gapparov (Uzbek Plant Protection Institute, Tashkent, Uzbekistan): *Locust and grasshopper control in Central Asia: new trends*

7. Orthopteran Functional Genomics: Big Genomes and Big Challenges

Organizer: Greg Sword
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Co-organizer: Darron Cullen
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Introduction:

A rapidly growing range of molecular genetic techniques continues to provide new insights into the biology of Orthopterans. Studies of crickets, grasshoppers and locusts have employed microarrays, deep sequencing technologies and proteomic approaches to address a range of questions in Orthopteran behaviour, physiology, ecology and evolution. Furthermore, the increased use of RNAi has enabled the functional characterization of many genes, unraveling key molecular pathways that underpin wide-ranging physiological and behavioural processes. With due consideration for a broad audience, presentations will highlight the application of these approaches to Orthopterans as non-model systems, and emphasize their broad utility across a wide range of research programs from behaviour and physiology through to molecular ecology and evolution.

Speakers and topics:

1. Kenji Tomioka (Okayama University, Japan): *Molecular dissection of the circadian clock by RNAi*

in the cricket Gryllus bimaculatus

2. Heleen Verlinden (Catholic University of Leuven, Belgium):*RNA interference in the desert locust*

3. Xianhui Wang (Chinese Academy of Sciences, Beijing): *The whole genome sequence of the migratory locust, Locusta migratoria*

4. Bart Boerjan (Catholic University of Leuven, Belgium):*How epigenetic mechanisms might explain locust phenotypic plasticity*

5. Darron Cullen (University of Cambridge, UK): *Behavioural phase change in the Australian plague locust*

6. Rut Vleugels (Catholic University of Leuven, BelgiumBiogenic): *amine receptors in the desert locust and their role in behavioural phase transition*

8. Orthoptera in Culture & Education

Organizer: Charles Bomar
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Co-organizer: Qimiao Shao
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Introduction:

Globally, Orthoptera have a cultural history that is often not acknowledged the general public. Meanwhile, the use of crickets for good luck charms to imaginary Saints who chant to grasshoppers, Orthoptera have played important roles in determining historical, religious, and social context.

Part of this social context has been the use of Orthoptera as educational tools to train students from elementary to through graduate school about the ways of insects. How and more specifically when we expose students to insects, determines the future of the Society and its future membership.

Speakers and topics:

1. Charles Bomar (University of Wisconsin-Stout , USA) ： *From St. Urho to heavy metal deposition in chitin: Delivery of Orthopteran content to non-entomological audiences*

2. Doug Whitman (Illinois State University, USA) ： *Use of the Lubber Grasshopper (Romalea sp) in science education*

3. Shao Qimiao (BASF- China)： *History of Cricket Culture in China*

4. Mohammed OULD Babah (Centre National de Lutte Antiacridienne, Mauritania): *Perceptions of Orthoptera in religion and culture*

5. Ricardo Mariño-Pérez (University of Central Florida , Mexico): *Orthoptera in Mexican Culture*

Workshop

1. **Orthoptera Species File online** (http://orthoptera.speciesfile.org/)

Organizer: Maria Marta Cigliano
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Co-organizer: David Eades,
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Introduction:

The Orthoptera Species File (http://orthoptera.speciesfile.org/) is a taxonomic database of the world's Orthoptera (grasshoppers, locusts, katydids and crickets), both living and fossil. OSF has full synonymic and taxonomic information for more than 25,960 valid species, 43,090 scientific names, 179,300 citations to 12,400 references, 75,400 images, 480 sound recordings, 86,000 specimen records, and keys to 2,870 taxa. Since the inception of OSF its strength and value to the taxonomic community has been the combination of the complete coverage of synonyms and taxonomic literature for all taxa within it, the addition of digital images of type specimens, as well as interactive keys, sound recordings, and maps. The workshop will be focused not only on the basic features of the Public read only interface showing the Information and contents on the database and the different types of search; but also on some basic features of the Editing interface (adding images, specimens, changes related to the rank and status of a taxon name); and on the way that the program prevents changes that conflict with the rules of nomenclature. Besides, the potential of using OSF as a tool for monograph and revisionary studies of Orthoptera will be presented in this workshop, as a way of integrating many of the most recent cybertaxonomic tools with species descriptions.

Language of the Conference

English.

Registration

There are three alternative ways for registration:

1. Online registration

You may visit our website: http://ico.greatlocust.com and follow the instruction for on-line registration. Only USD will be accepted to be paid with your credit card. Other types of currency can not be used in this system. **Deadline for online registration is on the 10th of August, 2013.**

2. On-site registration

On-site registration fees should be paid with USD or RMB currency only.
No personal checks are acceptable for the payments.

Registration fee

Registration dates and fees as following:

	On-line Before 1st, July (Bank transfer)	On-line 2nd Jul. -10th Aug (Bank Transfer)	On-site 11th-14th, Aug (Cash only)
Participant/person	USD, 300 RMB, 1700	USD, 320 RMB, 2000	USD, 320 RMB, 2000
Companion/person	USD, 220 RMB, 1200	USD, 260 RMB,1500	USD, 260 RMB,1500
Student/person	USD, 220 RMB,1200	USD, 260 RMB,1500	USD, 260 RMB,1500

The registration fees have been raised, since the fees will cover all the meals (three lunch meals, five dinner meals, including the gala dinner, tea and coffee breaks), and the transfer from and to the airport, proceedings and abstracts, and a gift).

The online payment including PayPal and Bank transfer

1. PayPal

Please follow the instructions on our website on the page of Payment

2. Bank transfer

You may send your registration fee through bank transfer to following address and bank:

Affiliation: **China Agricultural University**

Bank: **The Construction of the Beijing Shangdi Branch Sales Department, China Construction Bank, Beijing, China**

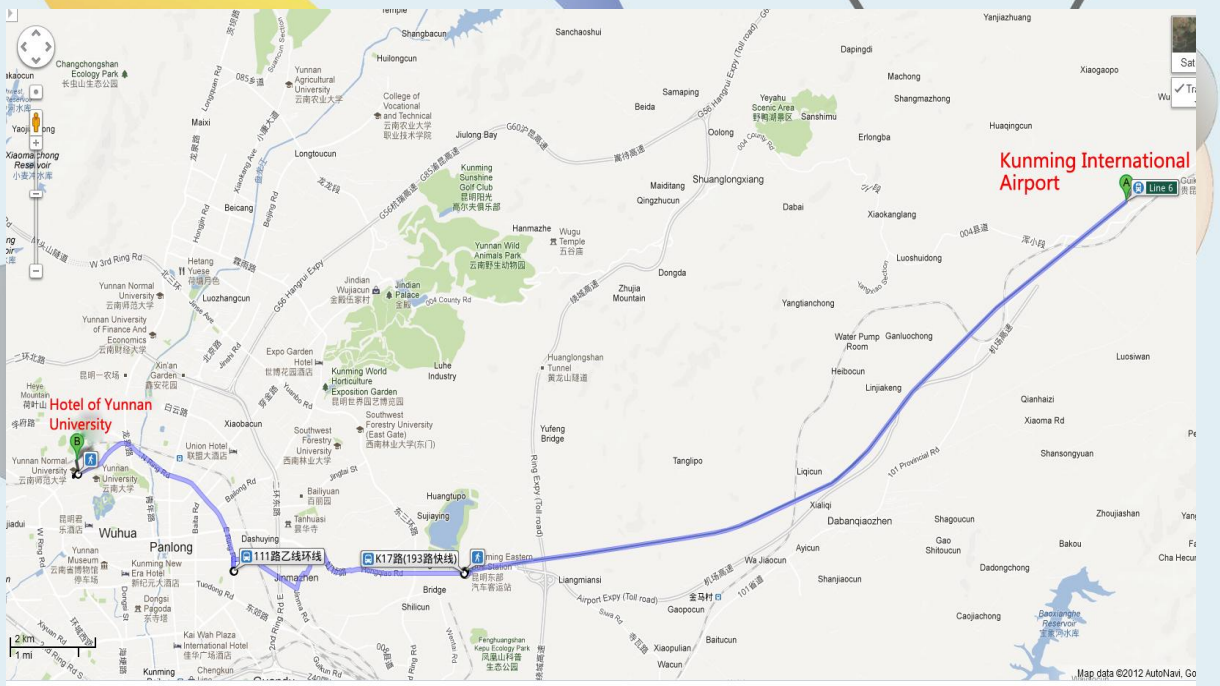
Account Number: **11001045300053003131—0002**

Important notes for registration:

1. In order to send the invitation letter to you in time for issuing your visa, Please fill the dates when you want to arrive at and leave from China, and the flight information when you register online.
2. For bank transfer, the payer should be institution, not individual. The payment should be noted with the name of "ICO2013" and the participant's name and address should be included.

Congress Venue

The congress will be held at Hotel of Yunnan University located at center of Kunming city, near to Green Lake (Cuihu) Park. It will take 40min Taxi from Changshui International Airport to the Hotel. You may check air-flight information on the website: http://www.ynairport.com/.



Please take me to The Hotel of Yunnan University (Yunda Hotel). The adress is Tianjuandian Lane, Yieryi Street, Wuhua District.
请带我到云南大学宾馆（云大宾馆），地址是五华区一二一大街天君殿巷。

Our on-site information desk will be at the Science Hall Building, and meeting rooms will be in the Science Hall Building on the campus of Yunnan University.

Awards

1. Best Poster and Oral Presentation Awards

The award will be presented during the Closing Ceremony of the Congress presented during the Closing Ceremony of the Congress.

Purpose

The purpose of the Best Poster and Presentation Award is to encourage students and young scientists (who received their Ph D no longer than four years time) to display outstanding presentations and posters during the ICO2013. These awards are intended to reward the presenters for the extra effort it takes to prepare a hallmark presentation.

Eligibility

The candidates for the prize-winner should be students and young scientists who received their PhD no longer than four years time.

Criteria

The award panel will consist of three Orthopterists' Society members with international expertise on different aspects of Orthopterology.

The criteria for the Best Oral Presentation and Poster Award are:- Clarity of submitted abstract

- Significant contribution to the study of Orthoptera fauna
- Importance of the work
- Novelty of the work
- Design of the poster and of the oral presentation

* Poster and oral presentation must have been exhibited and given during the ICO2013.

The award consists of:

- An amount of 500USD for first prize (for one person), 200USD for the second prize (each of two persons).
- A certificate.
- An inscribed plaque.

2. Sir Boris Uvarov's Award in Applied Acridology 2013

General status

The award bears the name of the Father of Modern Acridology, the famous Russian-English orthopterist Boris Petrovich Uvarov (1888 – 1970). This award, sponsored by the Association for Applied Acridology International (AAAI), and administered by the Orthopterists' Society, recognizes outstanding contributions which have a direct impact on both, the theory and practice of locust and/or grasshopper management.

The award consists of:

- An amount that varies depending upon the interest earned from the endowment;
- An inscribed plaque;
- A certificate.

The award will be presented at the 11th International Congress of Orthopterology, the next Orthopterists' Society International Meeting; however, the award will not provide any financial support for the recipient to attend the meeting. A short bio of the award recipient will be published in the newsletter of the Society, Metaleptea.

Nomination Requirements

The award panel will consist of three Orthopterists' Society members Nominations may be submitted by any person and/or organization. Membership in the Orthopterists' Society is not required. Self-nominations are accepted. Previous recipients of this award are not eligible for future nominations. Any candidate nominated, but not selected, is eligible for re-nomination(s).

Nominations packages must include a CV of the nominee (10 size font, 5 pages maximum, including publications) and a letter of recommendation specifically stating the nominee's:

- Significant contributions to the theory of locust and/or grasshopper management in the form of publications, research grants, student advising, and presentations at national and international scientific forums;

- Evidence of major impact into the practice of locust and/or grasshopper management at national or international level.

Electronic Submission Requirements

All nomination packages must be submitted electronically (paper nominations will not be accepted). Acceptable file formats include: DOC, RTF, and PDF.

Deadline

Application/nomination packages must be received by the Executive Director of the Association for Applied Acridology International, Dr. Alexandre Latchininsky (Latchini@uwyo.edu), before June 1st, 2013, who will confirm receipt of nomination packages, and also notify nominators of any problems with nomination package files within a week after the deadline.

Evaluation procedures

Nominees/candidates will be judged by an award panel consisting of three Orthopterists' Society members with international expertise in both theoretical and practical locust and/or grasshopper management plus 2 previous recipients of the award. The panel will be selected by the Executive Board of the Orthopterists' Society.

Notification

The President of the Orthopterists' Society will notify all candidates and their nominators, where applicable, with the results of their application approximately one month after the application/nomination submission deadline.

3. D.C.F. Rentz Award

The Orthopterists ´Society is pleased to call for nominations for the "D.C.F. Rentz Award" to be presented at the 11th International Congress of Orthopterology that will be held in Kunming, China, August 11-15Th, 2013. The award is intended to recognize the outstanding contributions of the nominee to Orthoptera research, particularly the work of retire or emeritus Orthopterists who have devoted their entire life to the study of Orthoptera. Complete applications consist of a letter of nomination with a brief description of the accomplishments of the candidate proposed, and one or two letters of support. The OS Executive Board will choose among the nominees, and the

awardees will be presented a personalized award certificate to reflect the nature of their contributions to Orthopterology during the gala dinner in Kunming.

Proposals should be sent to Maria Marta Cigliano (cigliano@fcnym.unlp.edu.ar) before June 15th, 2013

Wheather

The weather in the city is very comfortable. Because of its year-round temperate climate, it is called The Spring City. The temperature during August, when the Congress will be held, is around 18-25℃.

Post conference tour

The congress organizing committee has arranged with a tourist company the organization of two post conference tours (line 1 and/or line 2) for participants. In addition, the tourist company will offer several daily tours in Kunming and surrounding areas for accompanying persons during the conference.

LINE 1

Stone Forest & Colourful Yunnan, one day.

Time: 6:30-17:30, 15th August，2013

Fee: RMB 290.00（USD50）/person. Fees include: Tickets, meals (team meal), car fare, Tour guide service charge, Sunbonnet, Mineral water, Insurance.

Route:

In the Morning, go to Stone Forest, National 5A scenic spot (about 1.5 hours) by bus. Then, visit Big Stone Forest, Small Stone Forest, Naigu Stone Forest (Statue named Ashima, Amah Rock, Lotus pool, Jianfeng pool, Pavilion at the peak, The lion pavilion, Ten thousand years of ganoderma lucidum, Swim with mother, Stone prison, and so on about 3 hours). After Lunch, visit Colourful Yunnan.Back to Kunming by coach.

LINE 2

Journey for Dali, Lijiang and Shangri-La, Eight Days and 8 Nights

Time: 8 days, from 16th-23th August, 2013

Fee: RMB 2600（USD450）/person. Fees include: The first tickets of every viewpoint, meals (16 meals), accommodation (8 nights, three star), car fares, Cruise fee in Dali, Erhai Protection Foundation, Lijing ancient town maintenance fees; mountain entrance fee, cableway fees, Guide services fees, Insurance.

Route:

D1: Leaving for Dali from Kunming after breakfast; sightseeing Ancient Town of Dali; enjoying exotic foreigner street (90 minutes); visiting Erhai Lake after lunch; enjoying Bai

nationality dancing; tasting Three Dishes Tea; free activities after supper. Accommodation in Dali

D2: Leaving for Lijiang from Dali after breakfast; 90-minute break at Taian on way to Lijiang; visiting Black Dragon Pool for 60 minutes; sightseeing the Ancient Town of Lijiang, Square Street and tasting unique fascination of Lijiang; After dinner, free activity or participation with paid service for large scale of dancing show like" beautiful water and gold sand" and Naxi ancient music (at own expense). Accommodation in Lijiang

D3: Leaving for Shangri-La after breakfast and enjoying beauty of Jade Dragon Snow Mountain along the way; taking pictures at the first bend of Yangtze river (15 minutes); sightseeing world level valley called Tiger leaping Gorge (90 minutes); Participating Tibetan dancing and experiencing leisure's of Tibet people(at own expense). Accommodation in Shangri-La

D4: Sightseeing Bita Sea, Shudu Lake, Ecology Village in Pudacuo Park(240 minutes); visiting Tibetan dragon biology (40 minutes); sightseeing Shika Snow Mountain by cableway, where snow mountain, valley, forest, lake, flower sea, meadow are enjoyed with Tibetan costumes and ecology; free activates after super. Accommodation in Shangri-La

D5: Sightseeing Songzanglin Temple in the morning after breakfast; Visiting Dukexong ancient town in the afternoon. Accommodation in Shangri-La

D6: Returning to Lijiang after lunch and break at Diqing Traveling Service Station for 30 minutes along the way; If possible, relaxing at bars of Lijiang (at own expense). Accommodation in Lijiang

D7: Sightseeing Jade Dragon Snow Mountain; enjoying Yunshanping, natural pasture "Ganhaizi", "Baishuihe", colorful river "Blue Moon Valley" by cableway (4 hours); traveling Lijiang Spirulina after lunch and leaving for Dali; break at Taian again (40 minutes) along the way; free activity after super. Accommodation in Dali

D8: Sightseeing Three Pagodas of Chongsheng Temple (90 minutes) and Butterfly Spring of the Holy Land of Bai people's love (60 minutes); returning to Kunming and the end of a pleasant trip. Accommodation in Kunming

Local Organizing Committee Members

Honorary Chairman

Xiangchu YIN, University of Hebei, Baoding, China

Le KANG, Chinese Academy of Science, Beijing, China

Chairman

Long ZHANG, China Agricultural University, Beijing, China

Vice Chairmen

Aidong CHEN, Institute of Plant Protection, Yunnan Agricultural Academy, Kunming, China

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