THE NEWSLETTER OF THE ORTHOPTERISTS' SOCIETY

Metaleptea

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Society News

Reports

Society News

Dear Colleagues, Dear Orthopterists

*It is a great pleasure for us to welcome you all to Antalya, Turkey and to the **10th International Congress of Orthopterology (June 21-June 25, 2009)**. We expect participants at this congress from all over the world — to meet and exchange experiences and ideas with others working in the diverse fields of orthopterology. All are invited to register and submit abstracts for either poster and/or oral presentations.*

A very exciting scientific programme has been planned, attractive to young research workers and developing scientists, as well as to more established research orthopterists. A wide range of subjects will be covered with plenary lecture and symposia/workshops aimed at giving overviews and updates on recent research. Besides plenary lectures, symposia and workshops, there will be special sessions of the regularly submitted presentations by collaborating research groups.

Antalya is an extraordinary place, made so by its wonderful nature and rich history. The town is located on the Mediterranean coast of Anatolia on the slopes of the Western Taurus mountain range. Here it is possible to benefit from beaches 8 months of the year; the 4-km Konyaaltı Beach runs right in the centre of town, and there are numerous others on the coast nearby. Though Antalya is a seaside town, a journey of only 40 km takes you to an elevation of 2500 m. Twelve of Turkey's 23 national parks are close at hand in the Mediterranean basin, and of these Termessos, Köprülü Kanyon and Olympos-Beydagları national parks will be most widely known to native people and foreign scientists.

History is everywhere in Antalya and there are several old Greek, Byzantium and Ottoman sites, among these: Patara, Perge, Termessos, Phaselis, Aspendos, Side, Myra, Antalya Castle, Alanya Castle and old Antalya (also called Kaleici). We invite international orthopterists to enjoy this wonderful nature and history in addition to sharing scientific interactions with their colleagues.

Antalya is one of the most famous places in Turkey, known world-wide; a considerable number of tourists from all continents visit here each year summer and winter. Recently, it also became a year-round centre for scientific organizations. This development led to the possibility of easy access to Antalya from nearly

10th International Congress of Orthopterology

Plenary Lectures

L. Lacey Knowles (Michigan - USA):
"Tracing paths of speciation: insights from phylogeography and population genetics"

Selahattin Salman (Kır_ehir- Turkey): "Dr. Tevfik Karabag, a memorial"

Maria Marta Cigliano (Argentina): "Systematics in Orthoptera: an uncertain future"

every city in the world. For this reason the second largest international airport of Turkey is located in Antalya. Recent developments in tourism have made it possible to find reasonable luxury-accommodations from well-known companies. Participants (and family) will be able to easily find flights to Antalya from all continents and comfortable accommodation during and after the meeting. Every attendant can arrange the most suitable accommodation for the meeting or after the meeting period by contacting "Saltur", the company in charge of the organization (www.ico2009.org).

We cordially invite you — everyone — to join us in Antalya for what will surely be a most exciting and memorable meeting! Not only we, but also several other organizations (Akdeniz University-Turkey, CIRAD-Montpellier-France, Palme Publisher-Turkey, Test Teknik-Turkey and National Gerontology Society-Turkey) invite you by supporting congress activities.

Please visit the web site of the congress for more information: www.ico2009.org

Looking forward to welcome you in Antalya,

Battal CIPLAK — *Antalya, Turkey*
Michel Lecoq — *Montpellier, France*

Plenary Symposia

Phylogeography and speciation: Organizer – L. Lacey Knowles (USA)

Communication and Orthoptera: Co- organizers- Klaus-Gerhard Heller (Germany) and Zhang Long (China)

Orthoptera and global changes: Co-organizers - M. Samways (South Africa) and Dan Johnson (Canada).

Integrated pest management for locusts and grasshoppers: are alternatives to chemical pesticides credible: Organizer - Michel Lecoq (France)

Orthopteromics: Unravelling the link between orthopteran genomes and phenotypes: Organizer - Greg Sword (Australia)

Workshops

Orthoptera in education: Charles Bomar (USA)

Biotechnology for locust control: A. Hilali (Morocco) and Tom Miller (USA)

Orthopterists' Society Statement of Income and Expenses for 2007 (in US$)

Income	**2006**	**2007**
Membership dues	5,925	5,019
Publications (subscriptions, publications, page charges)	13,756	11,373
Non-designated contributions plus contrib. of stock to Endowment & Operating Funds	11,187	16,699
Sponsored membership contributions	310	495
Research grant contributions (matched by anonymous donor included in non-designated contrib.)	1,595	1,300
Credit card fees	216	164
Checking account interest	48	0
Investment income (about 2/3 reinvested in Vang. Total Stock Market Index Funds)	2,505	3,009
Transfer from AAAI Acct. to repay OS loan for first Uvarov Award in 2005	580	0
Contribution From AAAI for Investment in AAAI Uvarov Award Account	0	2,000
Total Income	**36,123**	**40,059**
Expenses		
Officers remuneration [several 2007 checks cashed in 2008]	7,750	2,630
Editorial assistant	6,875	9,078
Assistance for Executive Director plus misc. small expenses	828	1,109
Printing: 2006 JOR 14 (1 &2), JOR 15(1), Metaleptea, CD Tucuras	12,033	
Printing: 2007 JOR 15 (2), JOR 16 (1) [JOR 16 (2) publ. and paid for in 2008]		6,179
Research Grants	6,547	5,400
Miscellaneous (returned checks and fees, wire transfer fees, refund, mailing for CD Tucuras)	246	1,072
Canmore Conference expenses	1,146	0
Credit card company fees	470	421
Transfer of Contribution to AAAI Uvarov Award Account	0	2,000
Total Expenses	**35,895**	**27,888**
Surplus (Income-Expenses)	**228**	**12,171**

Orthoptera Species File

The Society now receives a yearly payment from the Orthoptera Species File endowment at the University of Illinois Foundation. Such funds are disbursed entirely as grants by the Treasurer as determined by the OSF Office who is aided by a committee of Society members.

Income	**25,251**	**33,324**
Expenditures (Grants)	**26,286**	**33,324**

The difference between income and expenditures in 2006 results from the various costs of bank wire fees, etc., borne by the Society.

Orthopterists' Society Fund Balances 2007

	Fair Market Value	
	Beginning of Year	**End of Year**
Checking Account	8,841.94	3,648.23
Securities		
Vanguard Total St.Mkt.Index Fund (Oper.Acct.)	36,215.58	38,203.65
Vanguard Total St.Mkt.Index Fund (Grant Acct.)	16,383.36	17,283.26
A.G.Edwards & Sons (Oper.Acct.)	6,394.04	11,412.74
A.G.Edwards & Sons (Endowm.Acct.)	19,100.04	22,963.81
A.G.Edwards & Sons (AAAI Uvarov Award Acct.)	8,449.46	10,481.22
Total Securities	**86,542.48**	**100,344.68**
Total Assets	**95,384.42**	**103,992.91**

T. Cohn
@sunstroke.sdsu.edu

Species File Progress and Grants

There has been significant work on species files during the past year. There are now 14 species files, although only eight of them contain significant data. All of Polyneoptera is covered except for Dermaptera (data import in progress) and termites (planned for next year). Across all species files we have 47,956 valid species recorded (38,188 within Polyneoptera). Species File Software has newly added features including distribution maps; however, the map data is very incomplete. Progress with interactive internet keys has been noteworthy. The Orthoptera Species File has keys with 2,604 endpoints. That's a long way from covering 24,310 valid species in Orthoptera, but we're working on it. We welcome assistance from the Orthopterists' Society membership in adding data or merely telling us about errors and omissions.

The Orthopterists' Society in cooperation with the Illinois Natural History Survey offers grants for work that helps species files. Most of the past grants involved providing photographs of type specimens. However, any work that adds to the data in a species file within Polyneoptera can qualify. Doing the programming to enhance Species File Software would also qualify.

Work may be for a time period of up to three years. Our budget provides $40,000 for grants for 2009. Applications are due by December 15. They may be submitted via email to David Eades (dceades@uiuc.edu). The Society's Species File Committee will review applications and reach decisions by January 15.

A second grant program pays the cost of coming to Champaign, Illinois USA for up to two weeks to learn about editing species files. While it is possible to learn the editing without coming to Champaign, some parts such as editing the interactive keys are much easier after some supervised training. Requests for travel expense may be submitted to David Eades at any time.

David Eades
(dceades@uiuc.edu)

Stewards of our profession

I recently returned from Washington, DC where I attended the AAAS (American Association for the Advancement of Science) and AIBS (American Institute for Biological Sciences) Education Summit 2008 as a representative of the Orthopterists Society. This was a meeting well attended by presidents, executive directors, and education committees from numerous biological societies. Note the last group, an education committee. I think it is pertinent to note the focus of the meeting was improving science education.

As it turns out, many Societies are having issues with memberships, namely memberships to diverse ages, genders, and ethnicities. Most societies do not have educational committees, let alone educational activities within their memberships. There are models for success of course; programs such as SEEDS run by the Ecological Society of America, and the Microbe Library supported by the American Society for Microbiology. Each of these societies seeks to actively engage students, faculty, and researchers in the profession that they support. Moreover these educational committees connect the generations of the past, present, and the future.

To add to this dilemma of membership development, many universities (mine included) have reduced or eliminated courses in the classic "–ology's," such as Zoology, Ichthyology, Ornithology, Herpetology,

as well as Entomology. Some others that do offer a course in entomology do not offer it on a regular basis, let alone a course on Pest Management or Current Topics in Orthoptera. Few universities offer Entomology as a regular offering any more. In my own courses I present most topics in biology and the environment by deferring to insect examples—it may be as close as I will get to teaching entomology anytime soon. There is a plethora of literature to support that undergraduates have lost a connection to the outdoors and natural world, a decrease in the interest and removal of subsequent university offerings of courses such as these is an accepted, but not acceptable consequence.

Yet we still prevail as a Society; many of the above diversity issues don't exist. We have members from 57 countries and we add about 10 new members each year. Currently the society has 370 members; about 50 of these are student members. Some of these student members will likely carry the Society into the future. Because of what I do, as well as many members of the Society, we need to support each other and the profession of entomology in the educational realm

Next summer we as a Society will convene at the 10th International Congress of Orthopterology in Antalya, Turkey, 21-25 June 2009. I propose we talk about teaching and transferring our profession through an educational lens to the future. If you are interested in sharing a teaching methodology that utilizes Orthoptera please consider presenting at this workshop. Presentations should be about 20 minutes long and may include innovation, pedagogical techniques, assessment, curriculum models that engage students using insects. If you are interested in participating in any way, please contact me so that we can start generating a quality venue.

I believe we have a responsibility of teaching, and it is a responsibility we need to begin to promote as a society. Transfer curriculum to the masses. Quality experiences for graduate as well as undergraduate students

Charles R. Bomar PhD
Executive Director, Orthopterists' Society
bomarc@uwstout.edu

JOR on the web: from its editor

Preamble
This article is about the the Journal of Orthoptera Research and the world wide web. My intention (with some help from Maria-Marta), is to tell members of our Society how things progress with their journal.

There are now two versions of every paper published in JOR: print and pixel. The traditional printed version costs way more to produce. But most authors still want to see their work in ink. So continuing into the near future, we will maintain the press version, in tandem with the PDFs that appear on BioOne.

(As an aside: discontinuing print is something that should be discussed at length by the society. We could significantly reduce publishing costs this way. On the web we have unlimited use of colour for figures, photographs and drawings --- not so in print. On the web we can even incorporate animated figures (video). All our growth potential in readership lies with the web version. Nevertheless, I reiterate: most authors want to see their work in print and many are willing to pay the extra cost: so I think print is here for a while yet, perhaps indefinitely.)

An editorial board for JOR was established subsequent to the meetings in Canmore, comprised of some of our more prominent members. This board has helped to improve the review process. When in 2000, we went

from one to two issues a year, we greatly reduced the time between submission of a manuscript and its publication. Now the web offers the opportunity to make a much more significant reduction in 'time-to-appearance' (see below).

Also in 2000, JOR became a part of BioOne: an aggregate of biological journals on the web, subscribed to by libraries all over the world. BioOne gives JOR a prominent web presence which has enabled the Society to expand its subscriber memberships for both orthopterists and institutions -- and so to widen its readership and influence.

In 2006 the first nine volumes of JOR became available on JSTOR. This retroactive conversion combines with BioOne to put all 16 volumes of JOR on the web to be read in situ or downloaded in HTML or PDF format. Through BioOne and JSTOR our journal has been introduced to many new institutions and reintroduced to those, who for reasons of budgetary constraint, had been forced to drop the print subscription.

Indexation ISI

The process is underway to have JOR indexed -- important benefits arising from publication in an indexed journal being recognized by the scientific community. JOR was submitted to ISI Thomson for evaluation in 2007. At least three consecutive issues are required to complete this process. ISI Journal Selection applies criteria 'such as, basic journal publishing standards including: timeliness of publication, adherence to international editorial conventions, english language bibliographic information such as english article titles, keywords, author abstracts, and cited references. ISI also examines the journal's editorial content, the international diversity of its authors and editors. Citation analysis using ISI data is applied to determine the journal's citation history and/or the citation history of its authors and editors'.

We ask our members to help advance the cause of successful indexation by preparing your papers with a broad readership in mind. (This is a request that just asks for good practice in scientific writing.) Aim to make your papers interesting to a broader readership; explain context information more fully and with less jargon; discuss ideas in an expansive manner; cite widely to put the work in context. Scientific writing shouldn't be obscure. And it should be easy for possible readers to find your paper: key words and an attractive informative title are important. All these items will be helpful during the review process by ISI Thompson.

Announcement one: re BioOne

BioOne has become JOR's most important form of published existence, much more important than its print version, because it reaches so many more people. BioOne can be visited by going to >http://www.bioone.org< and then browsing to JOR. Some modest 'open access' is currently available for a selected article in each current JOR issue; but to have complete access for reading or download to all papers back to 2000, you have to access the site via your 'participating institution'. The commonest such institution is a library (or another entity associated with a person's workplace). The library has to subscribe to BioOne and so pay to be the electronic route from which you arrive at BioOne. You can access JOR on BioOne as a 'common' web user, but the articles are mostly not available. The same limitation exists for JSTOR access >http://www.jstor.org<.

BioOne recently offered societies such as ours a way to provide its members with unrestricted direct access to all past and current JOR papers on BioOne: "Society Member Access Program". This web avenue is now functioning: every published paper in JOR (from volume 10 forward) is available in its entirety for reading or download – so long as you are a society member. 'Secure access' is required by BioOne, so members need to identify that they belong to their 'institution', in this case the Orthopterists' Society. We will soon send all individual members their diagnostic 'user name' [actually a number] and a 'password', allowing authentication of 'Member Individuals'. In future conveying or updating this user name and password will be associated with membership renewal (or new memberships).

To access this route to BioOne back issues go to a new JOR website *http://www.utm.utoronto.ca/~utmjor/*

It is presently just a single page: there you will see two links -- one for submitting manuscripts to JOR (see below) and -- one taking you to BioOne for access to back issues. When you have chosen a text or PDF version of a paper you will find you are denied access unless you scroll to the bottom and enter your username

and password.

This new journal page (the 'JOR page') can also be reached via a link newly established on the Orthopterists' Society main page: click Journal under Publications in the left side list and on the next page, click on 'new JOR website'.

Publication agreement: copyright
BioOne, at its annual meeting this year, drew attention through one of the presentations given there (Trisha Davis, Ohio State Univ. Libraries), to the need for setting up a formal agreement between the author and publisher – the publisher being the Orthopterists' Society. BioOne have offered guidance in the form of a 'Model Publication Agreement' which we will be adopting at JOR. It protects both author and publisher rights regarding what appears in JOR. Beginning with the current volume, volume 17(1), authors will be asked to sign this agreement, embedded digitally in the OJS access described immediately below.

Announcement two re OJS
At present authors submit their papers in the form of files, usually attached to an e-mail. Most of what follows for the editor and editorial assistan involves contacting associate editors and reviewers, sending mss, accepting, rejecting, asking for revisions, sending PDFs to be proofed etc. With such a large flow of correspondence, regrettably, in the past sometimes things have been misplaced.

Starting now with material for volume 18, our method of paper submission is via the web. Using software supplied by Open Journal Systems (OJS), all manuscript submission and review is on-line. **If you have a paper to submit to JOR, to be considered for publication, go to *http://www.utm.utoronto.ca/~utmjor/***

Click on the link you find there called: 'Authors transmitting manuscripts to JOR'. Via this you will arrive at the Open Journal System's page for the Journal of Orthoptera Research. The first thing you will be asked to do here is to register, creating a username and password for your particular paper submission. This is in effect a personal set of files accessible only to the editor and editorial assistant. You then follow the directions there, choosing appropriately to submit your paper, its text file, figure files, table files etc.

Authors, reviewers, editors and editorial assistants all access different parts of this same OJS system. By making certain mouse-click choices authors submit their manuscripts, reviewers their reviews. All correspondence related to reviewing and acceptance is now managed via this same site and its software. This should greatly improve the speed of our reviewing and by keeping us less confused eliminate all possibility of lost material. Announcements about the existence of this new procedure will also appear in the 'Instructions for submissions of papers' on the inside back cover of the printed journal (see volume 17). **In the event that an author experiences any difficulty in submitting their paper in this fashion they should contact the editor *glenn.morris@utoronto.ca* or editorial assistant directly by e-mail: *jor.utm@utoronto.ca***

Journal function
What is a journal supposed to do for the members of the society that publishes it? I think it should provide a place to validate our research and to transmit it to others. Authors should expect: 1) feedback that will help to improve their paper, 2) good-looking output, 3) timeliness in the review and composition process, and 4) accessibility -- that their paper will be found easily and by a wide readership.

Reviewing: accepting and rejecting
Somewhat to my surprise, I have never in the past 9 years, received a paper I thought could be published 'as is'. I suppose this just means we all think we can improve on someone else's work – or at least would do things differently. Though some manuscripts are of course rejected outright, most are sent back for revision. I believe the best reviewers are those who actively read for positive content. The reviewer's attitude should be 'we want to publish this and here is how can we make it better'.

Not everyone produces an effective review and for diverse reasons: some people are not critical enough, some are way too critical, some can never be reached to be asked, some are way too slow, some are too emotionally involved in an issue, etc. But there is a large workforce of colleagues out there, both members and nonmembers, that continue to provide me with effective, constructive reviews for JOR. They have done this without recognition (I think anonymous reviewing is important) or payment. Every author must all be grateful for the efforts of these people and of course

the editor must be especially grateful.

Because JOR is international and because science is mostly in english, many of our society authors have to work without their normal writing skills. I appreciate this difficulty and papers are never rejected for their problems in english expression. This sometimes means a great deal more correcting and sending to and fro. If an author knows their english will be a problem they should seek help in that regard prior to submission.

Handsome Appearance

I think the journal has always 'looked well', though of course there is always room for improvement. Previous editors had a good eye for appearance, for clean readable text, well-placed figures and interesting covers. The covers have become a particularly engaging aspect for those engaged in production. Here is another instance where colour means cost. Most people accessing papers in JOR via the web do not even see the cover (except as a small BioOne icon).

Editors are fussy. For example we spend a lot of effort on matters of trivial punctuation events --- in search of consistent style. Whereas admittedly one misplaced comma is trivial, the cumulative effect of many commas affects appearance, which in turn affects readability. I believe fussiness is a diagnostic feature of an editor.

The single biggest problem we encounter in composing JOR papers is the low quality of submitted figure material. Though the necessary procedures are clearly outlined in the 'Instructions for submission of papers' on the inside cover, almost nobody meets minimal requirements for figure resolution.

I suspect nobody reads these instructions: experienced authors don't think they need to and perhaps neophyte authors can't find the time to find them -- they are easily downloaded from the society website. (There are exceptions to this blanket condemnation, and dear reader/author: you may wish to think about whether you are one of the exceptions.)

Line drawings, one of the commonest components of JOR papers, have to be scanned at better than 900 dpi (dots per inch) or they look like the random walks of insects on sand. And as with insects it is always important to think about where one is headed: what will be the final size of the illustration: be aware of the size that the finished picture will occupy on the printed page.

Recently I came suddenly to realize why older journals were so often structured with a set of 'grouped plates' at the back of the volume. It has to do with the signature structure of printed journals and is the most efficient way to put colour into a publication. One shared colour signature (4 sheets, 8 pages) can be placed among the text signatures and its cost and use shared by a number of authors. As no doubt is apparent to all we have begun doing this in JOR on a fairly regular basis.

Timeliness

Timeliness has not been well met in the past, not surprising in a journal that appeared only once a year. Of course delays were reduced when JOR became bi-annual in 2000. But authors still risk a wait-period maxium of almost 6 months if they happen to submit at just the wrong phase to our output cycle.

The web offers a new possibility for addressing this problem of long-duration latency. Many papers are ready as pdf files well in advance of the moment of 'going to press'. A paper can be reviewed, revised, composed, and sitting in a computer for 4 months as a pdf. Such a paper could be put up onto the the web several months before the actual printed issue: a process sometimes referred to as 'prepublication'. We are exploring the possibility of prepublication with BioOne. For an ideally prepared paper, it could bring delay in web publication to less than a month.

Accessibility

Good accessibility on the web means that an author's work can be found by the important search engines (Google Scholar, Web of Science, Scholars Portal, Scopus, Biosis etc.). So it can reach the largest number of potential global readers. Ideally it will turn up early in generated search lists.

Choosing good key words is terribly important in advancing this search process and everyone associated with publishing in JOR in the past, including this editor, has been too lax in choosing effective key words. Sometimes authors forget to include them and I find myself making up a list just before the pdf file goes to press. These key words should not be repetitions

of words in the title. An author should imagine themselves in the place of a searcher: what words would this person be likely to use in a search? Searchers can take many forms: cladists, university students, politicians? What words would these different searchers use?

It is surely true that all authors want recognition: they want their findings to be accessed and to be part of the thinking of others. Via the web, potential JOR readership has become astronomical. Recognition by a huge readership is now possible. Via the web papers in JOR can now be accessed by anyone who needs good information about Orthoptera: from an evolutionist contemplating the history of some taxon, to an economist considering the cost effects of locust swarms, to a student preparing a grade school project on rainforest tettigoniids. Diverse users these: but they and even many accessing specialists will only actually use papers that make content clear and understandable.

I think a lot of scientific writing is quite uninteresting. And editors bear much past responsibility for squeezing out interest. They have argued the need for economy of space and then gone about declaring all sorts of content extraneous. With web publication this is an unnecessary economy. Many of the costs of print are absent from the web. It is no more expensive to post a small paper than a large paper. It costs no more to have graphs with different coloured lines or vivid colour pictures ot the study insect.

Because of the web it has become less important than it once was to stamp out digressions or elaborate explanations. Writers of papers should not fear to write well and explain fully. I am not arguing for less rigor in testing hypotheses or providing complex detail. But I think that a better paper will accompany such things, with content that aims at nonspecialists. Echoing something said above under 'indexation' I therefore ask that members of the Orthopterists' Society send me papers that err on the side of expansive background and explanation. Make them understandable to a wider audience. Include more natural history. I think making them more interesting will improve our society's journal. This editor will not be trying to squeeze out the interest.

Glenn Morris
glenn.morris@utoronto.ca

In Memoriam

ALEJO MESA (1928 – 2008)

In the late thirties, when I was a student in the College of Agriculture, I began to spend part of my time in the Laboratory of Entomology of the Ministry of Agriculture of Uruguay. The chief of the Laboratory was Francisco Mesa, a nice, soft spoken, quite unassuming man. It took me only a few days to realize that Don Francisco knew, about insect pests and the ways to control them, much more than what I had learned in the College of Agriculture.

With Don Francisco came often to the Laboratory, a 10 year-old boy, already very interested in the insects. He was his son Alejo. There and then began our lifelong friendship. Later, when I joined the staff of the University, Alejo became my assistant, and we worked together for many years. And together we made much field work, not only in Uruguay but also in Argentina, Brazil and Paraguay. But later, by himself, he did field work in almost all the rest of the South American countries.

Alejo made his University studies in our College of Agriculture (Facultad de Agronomía) in Uruguay. He graduated in 1946. His main interest ever, was the research in Caryology, Cytogenetics, and Cytotaxonomy of insects, particularly of the Orthoptera. In 1965, went to Australia where he studied under M.J.D White. There, in the University of Melbourne, he got his Master degree in 1968, and his Ph.D in 1970.
In 1970 he returned to Montevideo and to his old position in the College of Agriculture. But the situation there went from bad to worse in the seventies, under the military dictatorship than Uruguay suffered then. Many of the best professors were then expulsed from the University. Alejo would indeed have been one of them, had he stayed in the University. But, revolted by the working conditions there, he resigned his position and went to Brazil, where he got a place in the "Universidade Estadual Paulista" in the town of Rio Claro, State of Sao Paulo. There he became a professor in the Graduate School, where he taught Cytogenetics and Evolutionary Mechanisms in Insects. He stayed there for the rest of his life, teaching and doing research with undiminished enthusiasm and energy.

That desire to know that makes a scientist out a man was a leading force in his life. He had an eye to discover the interesting problems. And then, he will overcome every obstacle to solve them. For instances: he became interested once in the cytogenetics of the Ommexechidae, and tried to study all their genera. But he found that there was a Peruvian species, *Cumainocloidus cordillerae,* collected in the province of Cusco in 1911, of which only the female was known. It looked like an ommexechid, but without the male, it was impossible to know for certain where it belonged. Alejo decided then to find the males, and went to the type location in the Peruvian Andes. There he found plenty of females and apparently no males. Finally he discovered than certain very scarce small grasshoppers that at first he had thought to be immature females, were actually the males. He collected them and clarified the position of the genus within the Ommexechidae. He also collected in the Chilean and Argentinian Andes, at an altitude of over 3000 meters, where he found a very small acridoid species, described later as *Atacamacris diminuta*, and another diminutive new species described as *Illapelia penai*. The last one is possibly the smallest acridoid species ever known. It took Alejo keenness of observation to realize that these insects were adults of unknown species, not young nymphs of some other living in the place.

In one opportunity, Alejo obtained a place in one of the Braziliaan Air Force planes for flying to Lima, Peru. The plane landed in Iquitos to refuel. Alejo liked the looks of that nice town, right on the banks of the River Amazonas and at once decided to stay there. He collected in Iquitos and its surroundings, and from there he went to Lima by land. That trip is long and difficult, but was not so for Alejo, who enjoyed the trip and stayed in several places along the route, collecting very interesting specimens.

I believe I have never known anybody so identified with his research activities as Alejo was. My telephone rang once at about three in the morning. I woke up, ran to it. A telephone call at three in the morning is usually bad news. Not that time. It was Alejo from the laboratory in the University. He was exultant. He had found something very interesting in the chromosomes of a grasshopper. I was so glad it wasn't any bad news, that I listened to him patiently and congratulated him on his finding. Next day I asked, – Alejo, do you know what time it was when you called me? He had no idea, of course.

I have here a list of his published works. Of all his papers, I believe. Unless he forgot to register some of them. Unless there is one still in press. Between 1956 and 2004, he published 47 papers. Of 35 of them he is the only author or the first author. The rest with various co-authors, among them his first and second wives. Most of his papers deal with the chromosomes of Orthoptera. Not only acridids, but gryllids as well. But some are also of Coleoptera, Psocoptera and Isoptera.
In 1960, Alejo married Rosita Sandulski. They had three children, all girls. Rosita died of cancer in 1983.

In 1991 he married Paula Garcia-Novo. Their only son, born in Brazil, is now 9 years old. He is survived by Paula and four children: two of them born in Australia, one in Uruguay and another in Brazil. He died in Rio Claro, this year in the first days of July. By his own indications, his body was cremated and the ashes dispersed in a wood in Uruguay, his native country that he had never ceased to love, even if he had to spend most of his life away from it.

C. S. Carbonell ***cscarbo@montevideo.com.uy***

Student awards

Michelle Bayefsky-Anand won the "Young Naturalist Award" from the US American Museum of Natural History, with a project that she conducted at Kananaskis on the ecology of montane and alpine grasshoppers. Her research was partly in cooperation with Professor Dan Johnson. The award is given to only 2 students from each of grades 7 to 12, selected from approximately 750-1000 students from Canada and the U.S. Michelle is a 16-year-old Canadian, in 10th grade at Ramaz High School in New York City. Her paper will be on-line at AMNH next month.

Last year, Adil Adatia, a student at Winston Churchill High School, conducted an experiment in Dan's lab, and prepared a science fair project and poster that won 7 local, regional and national awards: Intermediate/Senior High Life Sciences, Best Poster, Best Senior Project, and overall Gold (Winston Churchill High School); Genome Alberta Awards: travel award to the Canada-Wide Science Fair; Agriculture and Agri-Food Canada Award ($750); and the Silver Medal - Biotechnology & Pharmaceutical Sciences (Rx&D Health Research Foundation Medal) $700.

Both students are currently preparing research paper manuscripts to submit to scientific journals.

Dan Johnson
dan.johnson@uleth.ca

Please welcome new society members for 2007.

They include:

Mary Brueggen , University of Missouri-Columbia, USA

Dragon Chabanov, Bulgarian Academy of Sciences, Sofia, Bulgaria

Gale Subscription Service, Detroit Mi USA

Mohamed Ghonaim, Orlando, Florida, USA

Sam Heads, University of Portsmouth, Burnaby UK

Karl Kral, Karl-Franz-University Graz, Austria

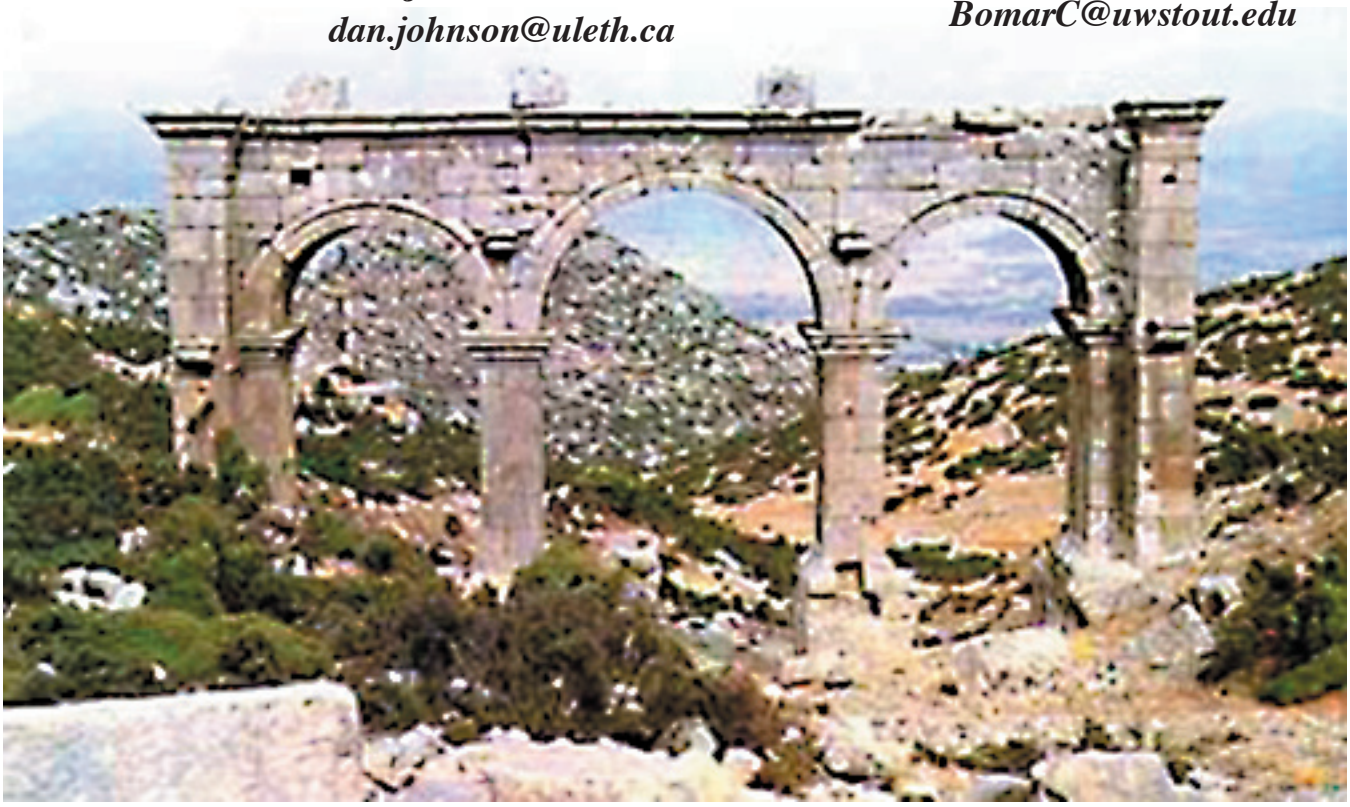
Michael Lachance, Virginia Cooperative Extension, USA

Jeffrey McMahon, Orlando, Florida, USA

James O'Hanlon, Macquarie University, Australia

Kelly Sakaguchi, Los Angeles, California, USA

Charles Bomar
BomarC@uwstout.edu



Reports

Russian Orthopterists' Meeting during the 13Tth Congress of the Russian Entomological Society

The 13th Congress of Russian Entomological Society was held in Krasnodar in 2007 (September, 9-15). The Congress was hosted by Kuban State Agriculture University, Kuban State University and All-Russian Institute of Biological Plant Protection. Krasnodar is the capital of Krasnodar Region (so-called Kuban area in the southern part of European Russia where famous Kuban Cossacks settled in the end of the 18th century).

Several hundreds of Russian entomologists and several dozens of their colleagues from different countries attended the Congress. Orthopterists from different parts of Russia - from St.-Petersburg to Vladivostok - could meet during the Congress. Orthopterists' meetings included the special Symposium concerning terrestrial orthopteran insects and some informal talks.

The Orthopterological Symposium included several presentations:

Stolyarov, M.V. (All-Russian Institute of Biological Plant Protection, Krasnodar). Current situation with locusts (Orthoptera, Acrididae) in the southern part of Russia.

Sergeev, M.G. (Novosibirsk State University and Institute of Systematics and Ecology of Animals, Novosibirsk). Orthoptera of North and Central Asia: what do we know and what do we want to know?

Storozhenko, S.Yu. (Institute of Soil Sciences and Biology, Vladivostok). Orthopterans (Orthoptera) of Korean Peninsula.

Belyaeva, N.V. (Moscow State University) Revision of the morphological features for termite species identification.

Dovgobrod, I.G. and G.M. Dovgobrod (Moscow State University) Computer analysis of the shape and position of morphological structures in the genital apparatus of termites (Isoptera).

Gorochov, A.V. (Zoological Institute, S.-Petersburg) Patterns of the cenotic evolution of Orthoptera and Phasmoptera in Cretaceous and Early Cenozoic.

Karmazina, I.O. and N.V. Shulaev (Kazan State University). Fauna of Orthoptera of Tatarstan Republic.

Belyaeva, N.V., I.G. Dovgobrod and A.V. Rasskazova (Moscow State University) Original habitats of termite *Reticulitermes lucifugus* Rossi (Isoptera) in the Black Sea Biospheric Reserve.

Terskov, E.N. (Institute of Ecology of Mountain Territories, Nalchik). Fauna of Acridoidea (Orthoptera) of Northern Ossetia-Alania.

Besides that, Prof. Michael Sergeev informed all participants of this Symposium about activities of the Orthopterists' Society. During this more or less formal Symposium and informal meetings orthopterists could discuss some actual problems and develop some ideas concerning cooperation between different groups of researchers.

Some presentations concerning different groups of orthopteran insects were done during other symposia [for instance, Aristov, D.S. (Paleontological Institute, Moscow) Features of fauna of the order Grylloblattida (Insecta) of the Solikamsk Horizon (Lower Permian, Ufimian Stage) of the Perm Region; Orlov, A.V. and A.N. Knyazev (Sechenov Institute of Evolutionary Physiology and Biochemistry, S.-Petersburg). Key parameters of life cycle, behavioural reactions and acoustic signals of the cricket *Gryllus argentinus* Sauss. (Orthoptera, Gryllidae)].

Unfortunately, some orthopterists could not visit the Congress. The abstracts of their presentations were published. Among them are:

Anisyutkin, L.N. (Zoological Institute, S.-Petersburg) Provisional data on the main ecological groups of Dictyoptera.

Benediktov, A.A. (Moscow State University) Vibratory communicative relations in communities of the family Tetrigidae (Orthoptera, Tetrigoidea).

Dolzhenko, V.I. (All-Russian Institute of Plant Protection, S.-Petersburg). System of the control of the Italian locust *(Calliptamus italicus* L.).

Savitsky, V.Yu. (Moscow State University) Factors determining habitat distribution and structure of communities of grasshoppers (Orthoptera, Acri-

doidea) in the semi-desert.

Vedenina, V.Yu. (Institute of Problems of Information Transmission, Moscow) Revision of the close related species of *Chorthippus albomarginatus* group (Orthoptera: Acrididae) based on the analysis of morphology and acoustic signals.

Vysotskaya, L.V., O.N. Gulyaeva and O.S. Kornienko (Novosibirsk State University) Revising some karyological and morphological features used in taxonomy and phylogeny of the family Acrididae (Orthoptera) on the base of nucleotide sequence analysis.

Several post-conference trips were organized. One of them included visit to Adyghe State University in Majkop (or Maykop), staying at the field station of this University in the western part of the Caucasus and visit to the Caucasian Biosphere Reserve. The field station of this University is situated in the perfect place in the altitudinal belt of the deciduous forests (mainly of beech) near the Belaya (White) River. However, this is not best place for collecting Orthoptera. Some endemic species from the genera *Podisma* (Acrididae) and *Psorodonotus* (Tettigoniidae) could be seen in the Reserve. The northern part of the Caucasian Reserve is near and above timberline. There are a lot of open spaces with meadows and bushes comfortable for local forms of grasshoppers and katydids.

Thus, the meetings of Russian orthopterists during the Congress of Russian Entomological Society were useful for development of orthopterological research in Russia and in the former USSR countries. In spite of some linguistic and financial limitations of international activities of Russian orthopterists I expect that at least several orthopterists from Russia and other CIS countries will be able to attend the next meeting of our Society in 2009.

Michael Sergeev

mgs@fen.nsu.ru

A phylogeography of the Canarian *Sphingonotini*

Martin Husemann, Jana Deppermann and Axel Hochkirch

Phylogeography is a discipline which connects distribution patterns and the phylogenetic relationships of species or lineages (Avise et al. 1987). The aim of phylogeography is to reconstruct colonization and vicariance events and unravel the evolutionary background of recent distribution patterns (Emerson & Hewitt 2005). The most important tools of phylogeography are molecular techniques (e.g. gene sequencing, allozymes, AFLP, microsatellites), geographic information systems (GIS) and coalescent methods for data analysis.

Archipelagos are excellent systems to study the genesis, maintenance and dynamics of biodiversity (MacArthur & Wilson 1967). Volcanic islands are particularly suited to study colonization and diversification processes as the geological history of such islands can easily be reconstructed and vicariance hypotheses can often be rejected a priori (Emerson 2002). The Canary Islands are of volcanic origin and their geological history is well known. Due to their high ages (ca. 20 million years), their subtropical location and their high habitat diversity, the islands belong to the global hotspots of biodiversity and endemism. It has been shown that the stepping-stone model is the most important model to explain colonization and diversification on the Canary Islands (Juan et al. 2000), suggesting a step-wise colonization of newly emerging islands after initial colonization from the mainland.

Supported by two grants of the Orthopterists' society, we aimed at unravelling the phylogenetics of the genus *Sphingonotus* with particular emphasis on the diversification on the Canary Islands. *Sphingonotus* is one of the largest grasshopper genera, comprising of approximately 120 species (Eades & Otte 2008). The genus is in need of taxonomic revision and a number of new species have been described during the last decade (e.g. Bland & Gangwere 1998, Defaut 2005, Lluciá Pomares 2006, Hochkirch & Husemann in press). Furthermore, *Sphingonotus* is the grasshopper genus with the greatest distribution among all genera of Ac-

ridoidea (Dirsh 1969). The centres of species richness are located in the Mediterranean region and in Central and East Asia, but some species occur in South Africa, Australia, the Caribbean and even on Galapagos. Currently, ten species of *Sphingonotus, Pseudosphingonotus* and *Wernerella* are known from the Canary Islands, including five endemics (Bland et al. 1996, Bland 2001, Hochkirch & Husemann in press). S*phingonotus rubescens* is the most widespread species. It occurs throughout northern Africa and southern Europe to Central Asia and is known from the complete Canarian archipelago. *Pseudosphingonotus savignyi* has colonized Fuerteventura, Lanzarote, Gran Canaria, Tenerife and La Gomera. It also occurs from northern Africa to northern India. Wernerella pachecoi is present on Lanzarote and in Morocco, while the other species are endemic to one or two islands. *S. willemsei* is endemic to the Cañadas on Tenerife, a geologically young region, which has been created during a relatively recent lava flow (ca. 200.000 years ago). *W. guancha* is endemic to Gran Canaria as well as *S. sublaevis*, which has also been reported from Tenerife (the latter record is doubtful). *W. picteti* is known from the coastal areas of Tenerife. *W. rugosa* is an endemic to the two easternmost islands, Fuerteventura and Lanzarote. These two islands are the only Canarian islands, which had been connected for some time. Our results suggest that there are at least two more, hitherto undescribed species on Fuerteventura (Husemann & Hochkirch 2007, Hochkirch & Husemann in press, Fig. 1) and La Gomera. The new species from Fuerteventura is rather common on sites with sparse vegetation (Fig. 2).

Fig. 1. Female of the new *Sphingonotus* species from Fuerteventura (see Hochkirch & Husemann in press).

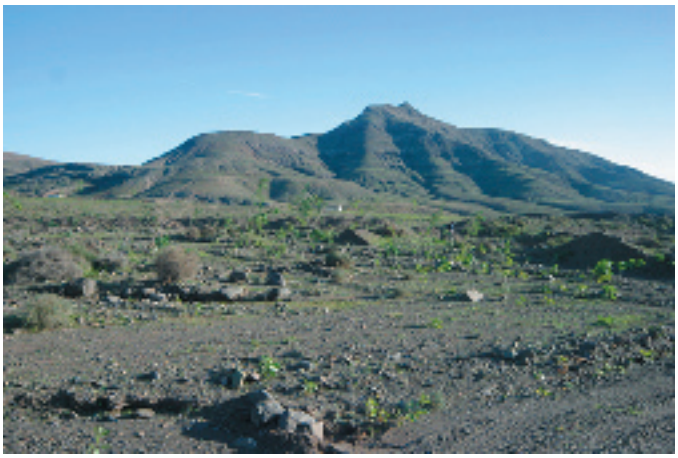


Fig. 2. Typical bare-ground habitat of the new *Sphingonotus* species from Fuerteventura

In our phylogeography project, we aimed at testing if the colonization of the Canary Islands by the Sphingonotus group followed the stepping-stone model. In order to answer this question we sequenced the mitochondrial gene fragments ND5 (NADH dehydrogenase subunit 5), ND1 (NADH dehydrogenase subunit 1) and 16S rRNA as well as the nuclear spacer region ITS2 (internal transcribed spacer 2). In total, our alignment comprised of 1919 base pairs. We included all known Canarian species and populations from nearly all islands. In addition we incorporated some European and African species. *Oedipoda caerulescens* and the Namibian *S. scabriculus* served as outgroups. We analysed the concatenated dataset with Bayesian methods, distance methods and maximum likelihood approaches. Parts of our results are currently in press in Zoological Studies. We found ten different lineages including two new species, one of which is described in the mentioned paper. Interestingly, our results also show that the Canarian endemics do not form a monophyletic group, but are rather distantly related. Some endemics belong to young clades, whereas others represent ancient lineages. Hence, we suggest a multiple colonisation pattern for the genus *Sphingonotus* on the Canary Islands. Only in one case, sister lineages are present on two neighbouring islands (*S. sublaevis* on Gran Canaria and *W. pachecoi* on Lanzarote), suggesting that most species colonized only one island or went extinct on other islands. This might be caused by a relatively good flight capability in combination with the strong geological dynamics of the Canary Islands. We also analysed the songs of six *Sphingonotus* species and found that the genus has a highly diverse song repertoire. We found at least eight different types of sound production, including wing crepitation during

flight or on the ground, tremulation with either the mid or hind legs, flicking with the hind tibiae, and three types of tegmino-femoral sound production. The latter are particularly interesting as they include different tegminal morphologies, which have already been mentioned by Johnsen (1985): (1) the Oedipodinae type (serrated intercalary vein, Fig. 3), (2) the *Pseudosphingonotus* type (thickened cross veinlets between media and radius, Fig. 4), (3) the *S. radioserratus*-type (serrated radius). While the Oedipodinae type represents the plesiomorphic character state, the other two morphologies are apomorphisms, which seem to have evolved only once. Possibly, these morphological innovations accelerated the diversification within the genus *Sphingonotus*. However, even among closrelated species we found a strong bioacoustic differentiation. *S. caerulans* and *S. rubescens* are difficult to distinguish morphologically and genetically, but they produce specific songs which are reliable for identification (Husemann & Hochkirch 2007).

In the future, we want to focus on the evolution of the different tegmino-femoral stridulatory mechanisms. A combination of morphological methods (SEM) and genetic methods (sequencing) might help us to evaluate the impact of morphological innovations on diversification rates. We will extend our taxon sampling to get a better overview of the evolution of such mechanisms in these Oedipodine grasshoppers.

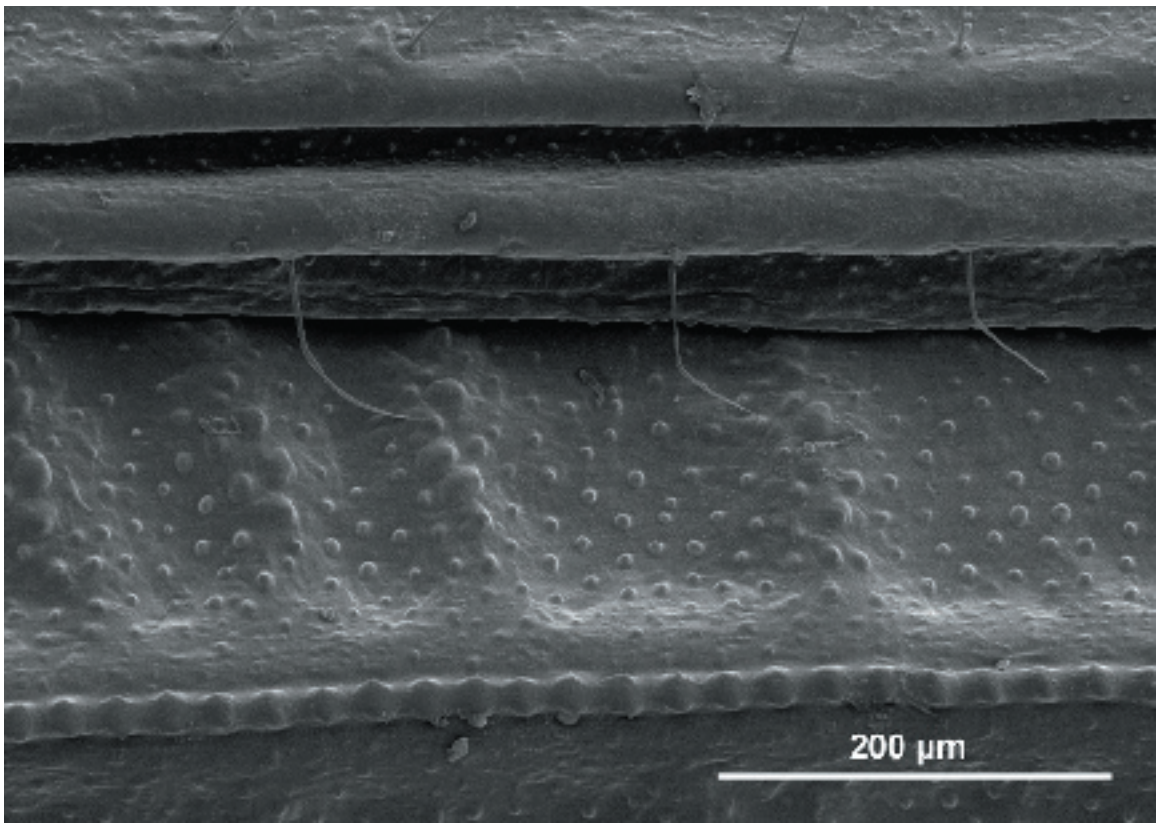


Fig. 3. SEM photograph of the stridulatory apparatus of *Sphingonotus caerulans cyanopterus* from Sweden (Oedipodine type).

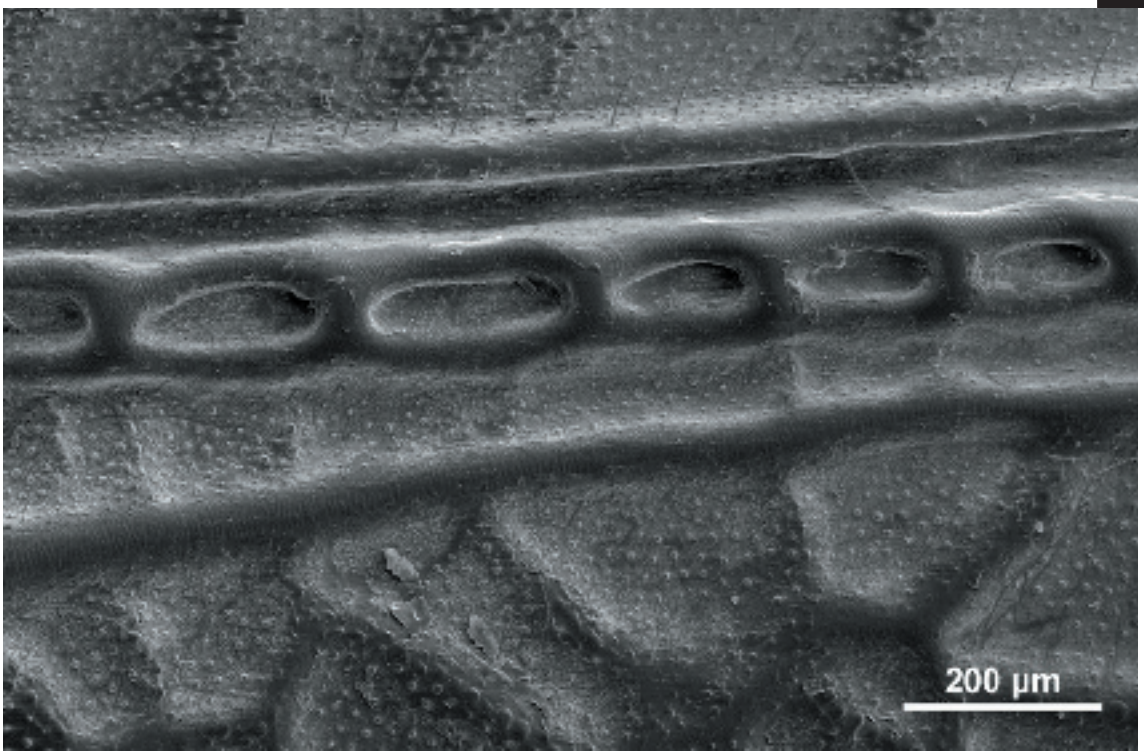


Fig. 4. SEM photograph of the stridulatory apparatus of *Sphingonotus finotianus* from Tunisia (Pseudosphingonotus type).

References:

Avise, J. C., Arnold, J., Ball, R. M., Bermingham, E., Lamb, T., Neigel, J. E., Reeb, C. A. & Saunders, N. C. (1987): Intraspecific phylogeographie: The mitochondrial DNA bridge between population genetics and systematics. Annu. Rev. Ecol. Syst. 18: 489-522.

Bland, R. G. (2001): Additions to the Orthoptera (sens. lat.) of the Canary Islands. J. Orth. Res. 10: 113-119.

Bland, R. G & Gangwere, S. K. (1998): A new species of *Wernerella Karny* (Orthoptera: Acrididae: Oedipodinae) from the Canary Islands, Spain. J. Orthop. Res. 7: 23-28.

Bland, R. G., Gangwere, S. K. & Morales, M. (1996): An Annotated List of the Orthoptera (sens. lat.) of the Canary Islands. J. Orthop. Res. 5: 159-173.

Defaut, B. (2005): *Pseudosphingonotus morini* sp. n. et *lluciapomaresi* sp. n., deux especes nouvelles en espagne (Acididae, Oedipodinae). Mat. Entomocenot. 10: 49-55.

Dirsh, V. M. (1969): Acridoidea of the Galapagos Islands (Orthoptera). Bull. Br. Mus. (Nat. Hist.) Ent. 23:25-51.

Eades, D. C. & Otte, D. (2008): Orthoptera Species File Online. Version 2.0/3.3. [10.05.08]. <http://Orthoptera.Species File.org>.

Emerson B.C. (2002): Evolution on oceanic islands: molecular phylogenetic approaches to understanding pattern and process. Mol. Ecol. 11: 951-966

Emerson, B. C. & Hewitt, G. M. (2005): Phylogeography. Curr. Biol. 15: 367-371.

Hochkirch, A. & Husemann, M. (in press): A review of the Canarian *Sphingonotini* with description of a new species from Fuerteventura (Orthoptera, Acrididae, Oedipodinae). Zool. Stud..

Husemann, M. & Hochkirch, A. (2007). Notizen zur Heuschreckenfauna (Insecta, Orthoptera) von Fuerteventura (Kanarische Inseln, Spanien). Entomol. heute 19: 59-74.

Johnsen, P. (1985): Contributions to the knowledge of the genera *Sphingonotus, Pseudosphingonotus* and *Wernerella* in Africa, with description of four new species (Acridoidea, Oedipodinae). Nat. Jutl. 21: 149-168.

Juan, C., Emerson, B. C., Oromí, P. & Hewitt, G. M. (2000): Colonization and diversification: Towards a phylogeographic synthesis for the Canary Islands. Trends Ecol. Evol. 15: 104-109.

Llucià Pomares, D. (2006): Descripción de *Sphingonotus gypsicola* sp. n. (Caelifera: Acrididae: Oedipodinae) del altiplano de Cataluña (España). Bol. Soc. Ent. Aragonesa 39:1-25.

MacArthur, R. H. & Wilson, E. O. (1967): The theory of island biogeography. Princeton Univ. Press, Princeton, NJ.

Proscopiids, enigmatic grasshoppers of the Neotropics

Alba Bentos-Pereira
University of Guadalajara, México

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The finding of a new orthopteran fossil in the Crato formation of the early Cretaceous of South America (Heads, 2008) is possibly the most important discovery that has been made in this deposit to date. But it undoubtedly raises more doubts and questions than it provides answers.

Today the family Proscopiidae, like many other groups of Orthoptera, is restricted to the Neotropical region. Its current northern limit is Costa Rica. It is a group with very well-defined characteristics, belonging to the Acridomorpha (i.e. the grasshopper-like Orthoptera) but its phylogenetic relationships are still somewhat uncertain.

While in their structure and general aspect, all the other exclusively Neotropical acridoid groups show a close relationship with the rest of the World acridoid fauna, the Proscopiids are entirely different, and any close relationship with any other group is not evident. According to Sharov (1968) the Proscopiidae were derived directly from the Locustopsidae in the Cretaceous, independently of the Eumastacidae which also originated in the Locustopsidae, but much earlier, in the Jurassic. Other authors, principally Amedegnato (1993), propose a much closer relationship between the two families via the Teicophryinae, an obscure and relict subfamily of restricted distribution in Mexico. From a cytogenetic point of view, the most primitive group of Proscopiids should be the genus *Hybusa* (which live in South America) with 2n =17 (Mesa y Ferreira, 1982), similar to the number seen in some Australian eumastacids. This supports our hypothesis about the centre of origin, which must be preAndean, possibly at the end of the Jurassic from some unknown group of S. American eumastacids. It also concurs partially with the opinon of Carbonell (1978), who postulated an early Gondwanian origin for the Proscopiids. What is quite evident is that the modern South American Eumastacids are not related to the modern Proscopiids. These modern Eumastacids divide into 2 rather homogenous groups: the tropical forms, which extend through the tropics to Brasil, and those of the temperate zone which are relictually present in Argentina.

The Eumastacidae, much more ancient and of Pangean distribution, have feeding habits which link them to the Gymnosperms and the pteridophytes, while the Proscopidae are usually generalists and eat angiosperms, that started to appear and spread in the middle of the Mesozoic; when they are specialists, such as in the genus *Astroma*, they again utilise an angiosperm (*Larrea* sp.), possibly a recent one too.

It has been generally accepted that the male genitalia of the Eumastacidae and the Proscopiidae are quite similar, as are some other aspects of internal structure, such as the details of the proventricular lining and the structure of the gastric caeca (Blackith & Blackith,1966; Bentos-Pereira & Lorier, 1995). One can also see this relationship clearly in molecular systematic studies (Flook & Rowell, 1998), although these do not resolve either the degree of relationship or the origin of the Proscopiidae. Furthermore, Matt et al (in press) used mitochondrial (12s, 16s) and nuclear (18s, 28s) ribosomal gene sequences to derive a phylogeny of the Eumastacoidea. They concluded that no analysis supported placing the Proscopiidae within any of the existing branches of the Eumastacoidea. Some placed the two taxa as sister groups within a Eumastacoidea s.lato., and some indicated that they are separate superfamilies. So, the particular origin and phyletic relationships of the proscopiids are practically unknown.

Likewise, despite the fact that the wings of *Eoproscopia* (Heads, 2008) are not extended, one can clearly see that the fossil had functional, well developed wings. In the apterous proscopiids of today the flight muscles have disappeared, producing significant structural modifications, principally to the apodemes (Zolessi, 1968). This suggests that the loss of the wings took place a long time ago. Some genera (*Anchocoema, Anchotatus, Astroma*) have wings but dramatically reduced. They use them for sexual displays rather than flight. Possibily they are part of the ancient stock of Proscopiids. They have a habitus like *Bazylukia* “but with a well developed fastigium, and live in the possible original zone.

It would not surprise me to find the fossil of an apterous proscopiid, contemporaneous with *Eoproscopia*. It is very possible that there could have been two evolutionary lines, one with the early loss of the wings and the other with the partial loss of the ability of flight

and the gradual atrophy of the wings.

In summary, the discovery of *Eoproscopia* gives us the following certainties:
a. Concerning the proposed origin of the Proscopiidae, the nearest hypothesis was that of Carbonell (1978).
b. The presence of the family Proscopiidae in South America dates from the Gondwanian period.
c. Originally the family had members with functional wings.
d. The reduction of the antennae is one of the characters which has developed subsequent to the origin of the group.
It also poses us with the following questions:
a. Why did the Proscopiidae not develop in Africa, which was still connected to S. America at the time of the fossil?
b. Do the Proscopiids derive directly from the Locustopsidae, or did they have an intermediate Eumastacid ancestor?
c. Were there two parallel lineages, one alate and one apterous?

References

Amedegnato, C. 1993. African-American relationships in the Acridians pp. 59-75. En: George, W. & R.Lavocat. Eds. The Africa-South America Connection. Clarendon Press. London.

Bentos-Pereira, A. & E. Lorier. 1995. Taxonomic value of the cuticular structures of the stomodeum in Acridomorpha (Orthoptera). J. Orth. Res. 4:185-195

Blackith, R.E. & R.M. Blackith. 1966. The anatomy and physiology of the morabine grasshoppers. II External anatomy and comparisons with Pyrgomorphidae, Acrididae and Proscopiidae .Aust. J. Zool. 14:1035-1071

Carbonell, C.S. 1978. Origin, evolution and distribution of the neotropical acridomorph fauna (Orthoptera): a preliminary hypothesis. Revta. Soc. ent. argent. 36(1-4):153-175.

Heads, S. 2008.- the first fossil Proscopiidae (Insecta, Orthoptera, Eumastacoidea) with comments of the historical biogeography and evolution of the family. Palaeontology. 51(2): 499-507.

Liana, A. 1980. Matériaux pour la connaissance des Proscopiidae (Orthoptera). Mitt.hamb.zool.Mus. Inst.77:229-260.

Matt, S., Flook, P.K.& C.H.F.Rowell 2007.- A partial molecular phylogeny of the Eumastacoidea s. lat. (Orthoptera, Caelifera). Journal of Orthoptera Research (in press).

Mesa, A. & A. Ferreira, 1982. Have the Australian Morabinae and the Neotropical Proscopiidae evolved from a common ancestor? A cytogenetical point of view (Orthoptera, Caelifera, Eumastacoidea). Acrida 10:205-217.

Rowell, C.H.F. & P.K. Flook 1998. Phylogeny of the Caelifera and the Orthoptera as Derived from Ribosomal Gene Sequences. Journal of Orthoptera Research 7:147-156.

Sharov, A.G. 1968. The phylogeny of the Orthopteroidea. Transactions of the.Institute of Paleontology .Academy of Sciences. U.S.S.R. 118. 251 pp. (English translation 1971).

Zolessi, L.C. 1968. Morphologie, endosquelette et musculature d'un acridien aptère (Orthoptera: Proscopiidae) Trans. R. ent. Soc. London 120(3):55-113.

Contacts

Please submit articles for Metaleptea via email: mnfeaver@ unity.ncsu.edu