Newsletter 18
December 2005

Newsletter of the African Arachnological Society

This is the newsletter of the African Arachnological Society (AFRAS). The aim of AFRAS is to foster interest in arachnids (non-Acari) of the African continent.

IN THIS ISSUE

Enquiries and information should be sent to the editor.

Editorial committee

Editor:
Dr Ansie Dippenaar-Schoeman

Co-editors:
Ms Annette van den Berg
Ms Almie van den Berg

Address
ARC-Plant Protection Research Institute
Private Bag X134
Queenswood 0121
South Africa

Email: DippenaarA@arc.agric.za

8th AFRICAN COLLOQUIUM OF ARACHNOLOGY

Report by the organizers:

The 8th African Arachnology Colloquium was held at the scenic Maselspoort resort outside Bloemfontein from 31 January to 4 February 2005, and was jointly hosted by the Dept. of Arachnology at the National Museum (Leon Lotz) and Dept. of Zoology & Entomology at the University of the Free State (Charles Haddad). This was the first time that the congress was held in the Free State, and it turned out to be a very successful occasion.

The Dean of the Faculty of Natural and Agricultural Sciences, Prof. Herman van Schalkwyk, and the Director of the National Museum, Dr. Rick Nuttall, gave a few words of welcome to all the delegates at the welcoming function. Because of the limited number of researchers working on African arachnids, the Colloquium is always a small meeting, but this year more than 30 delegates attended, including foreign researchers from Zimbabwe, Namibia, Belgium, Germany, England and the Czech Republic. In total, 29 papers and 8 posters were presented, many dealing with biodiversity and systematics projects that form part of two umbrella projects, the African Arachnid Database (AFRAD) and the South African National Survey of Arachnida (SANSA). The guest speakers provided talks of a high standard, and included presentations on Pseudoscorpion karyology and woodlouse-eating spiders by Franta Stahlavsky and Milan Rezac, respectively (Czech Republic), spider genitalic evolution (Rudy Jocqué, Belgium), and fossil and amber spiders (Dave Penney and Paul Selden, England). Included in the congress program was an "off day", where delegates were taken to Oliewenhuis and the Botanical Gardens for collecting and lunch.

Several interesting records were collected, and much public interest was generated through the activity of the arachnologists.

Two post-congress tours were held, where foreign delegates were taken to the Ndumo Game Reserve in northern KwaZulu-Natal by Charles Haddad, and to Tswalu Game Reserve in the Northern Cape by Ansie Dippenaar-Schoeman. Many interesting records and valuable material for karyological and ethological studies were collected, particularly by the two Czech scientists and Dirk Kunz of Germany. All of the tourists enjoyed themselves thoroughly, and were fascinated by South Africa's diversity of animals, and that doesn't just include spiders!

Report by one of the delegates - Meg Cumming:

"Vrystaat!", always a masculine and winning cry on the rugby field, displayed the same characteristics in the field of spiders. It is common knowledge that the spider ladies-team who have organised recent colloquia are amazingly efficient and charming, so everyone was a little anxious about handing over to 'The Boys' this year. But Leon Lotz and Charles Haddad confounded the sceptics and presented us with a colloquium which was perfect in every way. The venue was the Maselspoort Resort, 25km outside Bloemfontein, on the banks of a willow-dangling dam, with hills around, and opportunities for morning and evening walks. The National Museum, represented by Leon, and the University of Free State, represented by Charles, played hosts and also invited us to visit their premises in the city. Warm thanks are due to all involved

8th AFRICAN COLLOQUIUM (continued)

in the organisation and running of this very successful and happy meeting (with the students receiving a special commendation).

Argentina and Hispaniola were also represented. Invited guests, lending a Northern Hemisphere perspective to the proceedings, were Rudy Jocque from Belgium, Dave Penney and Paul Selden from Manchester University, and Milan Rezac and Franticek Stahlavski from Charles University in Prague.

The papers presented by this group were concerned more with anatomy, taxonomy, karyology and palaeoarachnology than with biodiversity, and they thus provided balance to the programme. Araneids featured specifically in 18 papers, with a handful dealing with scorpions and pseudoscorpions, and the rest with arachnids in general. Mention must be made of Ansie Dippenaar-Schoeman's input - she was lead-author of 4 papers and co-author of a further 10 i.e. she had a hand in 50% of all papers presented. One has to take off one's hat to the astonishing proliferation of research and public interest in spiders in South Africa - most of it emanating from the Plant Protection labs in Pretoria. Magazine articles, postage stamps, media presentations, school and public lectures have all coerced South Africans into noticing (and enjoying) spiders at last. Here one must also praise the

contribution of the Leroys, Spider Club members and other hard-working enthusiasts.

Certain non-spidery memories of Bloem will remain long in the mind - the generous supply of soft green peppermints, the glamour girls from Limpopo Province (with Benson providing stiff competition with his diamond ear-rings), Ansie and Annette relaxing in the sunshine and gossiping with the rest of us, Dirk Kunz's prize-winning picture of his finger being bitten by a sparassid, Rudy's dream, Stefan going 'deaf' after too much playing on the water-slide, star-gazing at the historic Boyden Observatory, lunch on the terrace of the Cape Dutch gem, Oliewenhuis, the beautiful floral art at the entrance to the lecture room, the ferocity of the ants in the Botanic Gardens, Dave Penney's crowd-teasing "its true identity will be revealed later …." , and, to crown it all, the bacchanalian 'Happy Hour' in the garden before dinner every windy evening.

Leon Lotz

Charles Haddad

At the colloquium dinner the following prizes were awarded:

Best paper: Rudy Jocqué

Best poster: Dave Penney

Best student paper: Dirk Kunz

Best student poster: Thembile Khoza

A special award of a beautifully inscribed scroll was made to Rudy Jocqué for his contribution to arachnid research in Africa. This award is to become an annual event.

MAGNIFICENT EIGHT SPIDERS OF AFRICA

In Africa the "Big five mammals" are a well known entity. At the 9th African Colloquium the arachnologists present decided to out do the mammals and to vote for the **eight** most magnificent spiders of Africa. Based on size, interesting behaviour and "best known" so that the public could identify them, the following spiders were voted for after lengthy discussions.

Theraphosidae: *Ceratogyrus*

Sparassidae: *Palystes*

Salticidae: *Hyllus*

Araneidae: *Gasteracantha*

Thomisidae: *Thomisus*

Oxyopidae: *Peucetia*

Pisauridae: *Thalassius*

Tetragnathidae:

"Africa to have its own "magnificent eight spiders"
Poster -
We are looking for good quality images for this poster.
Images of any of the genera mentioned above to be submitted to Ansie— photographers will receive a free copy of this wall poster if their image is used .

NEW MEMBERS

- **Dr Matjaz Kuntner**, Slovenian Academy of Sciences and Arts, in Ljubljana Slovenia, E-mail: Kuntner@gmail.com
- **Dirk Kunz,** Senckenberg Forschungsinstitut und Naturmuseum, Senckenberganlage 25, 60325 Frankfurt am Main. E-mail: Dirk.Kunz@senckenberg.de
- **Dr Milan Rezak**, Deptartment of Zoology, Charles University, Vinicna 7, 12844 Praha 2, Czech Republic. E-mail: pavouk.milan@seznam.cz

CONGRATULATIONS

Marianne Forsyth with the birth of her baby boy Ethan. We hope he will be one day as good an arachnid collector as his mother.
Dr Stefan Foord for obtaining his PhD degree at the University of Pretoria dealing with the systematics of the family Hersiliidae of the Afrotropical Region
Ian Engelbrecht for obtaining his MSc degree at WITS.
Mokgadi Modiba for obtaining her BSc (Hons) degree at the University of Limpopo. Her project was a survey of the spiders of Sovenga Hill (see publication list). She is presently busy with her MSc - a survey of the spiders of Polokwane Nature Reserve.
Lorenzo Prendini who is soon going to be a "daddy".

Thembile Khoza for obtaining her BSc (Hons) degree at the University of Limpopo. Her project was a survey of spiders of Marion Island (see publication list). She is presently busy with her MSc - a survey of the spiders of Polokwane Nature Reserve.
Mandisa Mgobozi for obtaining her BSc (Hon) at the University of the Transkei. Her project was a survey of the spiders of Dwesa Forest. She is presently busy with her MSc – the effect of chromalina, an invasive weed on spiders in KwaZulu-Natal.
Robin Lyle for obtaining her BSc (Hons) degree. She has revised the corinnid genus *Thysanina*, and the results will be submitted for publication soon. She will register for her MSc in 2006 and continue on the systematics of Afrotropical tracheline sac spiders.

NEWS SNIPPETS

SPIDERS IN THE NEWS

Spiders were in the news in South Africa in 2005 with highlights in the papers reading:

"***Spiders predict rain***" was the main feature in the papers and on the radio after a report by Astri Leroy on the rain spiders and how they predict rain in South Africa. Spiders of the family Sparassidae of the genus *Palystes* are very common in South Africa and known to enter houses just before a rainy spell—that is the good news. Unfortunately they are large (40 mm with leg span upt o 100 mm) and they cause quite a stir with frantic calls at night to anyone who knows anything about spiders.

"***African spider craves human blood*** " this one caused quite a stir after the article by Robert Jackson on the salticid *Evarcha culicivora* in Kenya feeding on *Anopheles gambiae* mosquitoes engorged with human blood in Kenya.

" ***Spider unravels murder***" – this heading appeared in the papers after a spider of the family Agelenidae (*Agelena* sp.), also known as the common grass funnel-web spider, was used for the first time as forensic evidence in a court case in South Africa. Dr Ansie Dippenaar-Schoeman was able to show to the High Court in Johannesburg that the spider, which normally builds a dense permanent funnel-web in the grass, was disturbed when the body was placed on the web, damaging it. The flimsiness of the "new web" made on the body of the murder victim, was enough evidence to show that the body was in that area for a very short period of time.

After the court case, the spiders received high media attention and several articles appeared in the daily papers weekly magazines, as well as radio talks and TV presentations.

NEW SPIDER PROPOSAL ON A GLOBAL SCALE

Norman Platnick

A new proposal for a Planetary Biodiversity Inventories (PBI) project was submitted under leadership of Norman Platnick. The aim of the project is to conduct a global inventory of the Oonopidae of the world to produce a phylogenetic classification for the estimated 2,500 species. A team of 24 investigators on six continents will assemble and sort the specimens available in collections and acquire new material through 12 expeditions that will concentrate on securing better samples of canopy-dwelling species, as well as fresh material for DNA sequencing. Team members will use existing cyberinfrastructure to build Internet-accessible databases of the taxa, the published literature, specimen locality data, and images and new application will allow team members to enter descriptive data into a multi-user database, in a highly structured format that will allow direct use of that information in formal descriptions for publication, on species web pages, in phylogenetic analyses, and in interactive keys. Automated identification systems, using artificial neural networks, will be developed, and the accuracy of those systems will be compared with that achieved by workers, ranging from total beginners to knowledgeable specialists, using interactive keys to the same taxa.
To produce a maximally predictive classification, phylogenetic analyses will utilize all available morphological data (which will be substantial, as oonopids show numerous, highly unusual features of both somatic and genitalic anatomy), and new DNA sequence data, which will be collected from multiple representatives of each of the oonopid genera and their outgroups (the three other families of dysderoid spiders). These analyses will interface productively with a currently funded spider ATOL project, enabling us to provide a seamless account of both the species-level diversity and the higher-level relationships of a significant chunk of the tree of life.

The broader impacts of the project include the training of several undergraduate, graduate, and postdoctoral stu-

NEWS SNIPPETS (continued)

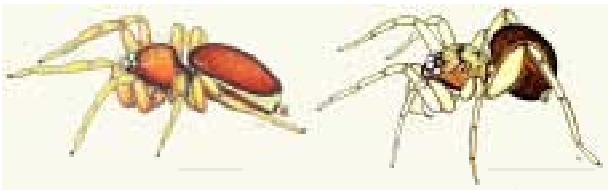
dents (with emphasis on recruiting members of groups currently underrepresented in the science workforce). International partnerships will be created through the direct participation of systematists, museums, and universities in at least seven countries.

Infrastructure enhancements will include the collection of new specimens, the sorting and identification of existing specimens, the establishment of Internet-accessible taxon, literature, locality, image, and descriptive databases, and the continued development of an automated identification system. Project outreach plans include a major traveling museum exhibition designed to focus public attention on PBI projects (not just our own) and on the excitement of biodiversity discovery.

The Principal Investigators are:

Rosemary Gillespie- University of California, Berkeley,
Charles Griswold- California Academy of Sciences,
Gustavo Hormiga-George Washington Univ.,
Petra Sierwald-Field Museum of Natural History,
Norman Platnick- AMNH,

Senior investigators for Africa continent: Ansie Dippenaar-Schoeman (South) and Rudy Jocqué.



ASSEMBLING THE TREE OF LIFE (AToL)
Phylogeny of Spiders

This multi-institution, multinational, six year project seeks to propose a robust phylogeny for all spider families utilizing molecular, morphological and behavioural data from more than 500 exemplar spiders and their outgroups. During January-March 2006 **Jeremy Miller** and **Hannah Wood** will travel through Madagascar and South Africa collecting specimens and tissues and recording behavioural observations for the AToL project.

ANOTHER NEW FAMILY TO THE AFROTROPICAL REGION OR MAY BE TWO

Jeremy Miller one of the team members at the California Academy of Science has discovered the first Synaphridae from Madagascar. Tharina Bird also collected a specimen in Namibia.

The Synaphridae also known as midget spiders are small araneomorph spiders with three tarsal claws; ecribellate; secondary haplogyne; eight eyes; toothed cheliceral keel replacing the usual cheliceral teeth; central notch in the tibial trichobothrium base and absence of a ventral femoral patch.

Rudy Jocqué reports that there might be another two new families: a possible Synotaxidae from Meg Cumming's garden in Zimbabwe and a Mecysmaucheniidae from a canopy fogging in Kenya.

INSTITUTIONAL NEWS

BELGIUM

Koninklijk Museum voor Midden-Afrika, Tervuren
Team-leader: Dr Rudy Jocqué

The lab in Tervuren is continuing its arachnological efforts in Africa and is growing.
The canopy project in Uganda is now coming off the ground (both literally and figurative). See the outline by **Domir De Bakker** hereunder.
The project has also expanded with a new researcher (**Wouter Fannes**) who started on 1st October 2005. Whereas Domir is focusing on the ecological aspects of the project, Wouter will study the taxonomy of selected taxa from canopy samples.
Rimma Seyfulina (from Moscow) is expected to join the team in January 2006 and will focus on African Linyphiidae. She will try to establish an interactive key for the African representatives.
Systematic research on the Corinnidae (**Jan Bosselaers**) and Ctenidae (**Mark Alderweireldt** and **Jean-François Van der Donckt**) continue. Several papers are in press or in preparation.
A identification manual to the 'Spiders of the World' by **Rudy Jocqué**and **Ansie Dippenaar-Schoeman** is almost complete and will be published in 2006.
Rudy visited South Africa in March 2005 to attend the 8th African Colloquium. With Ansie and Elizabeth (his wife) they undertook a post colloquium trip to Tswalu Game Reserve in the Northern Cape near Hotazhel.

Studying the African canopy spiders - the start of a long story
Domir De Bakker

The study of spiders from canopies of Afrotropical rainforests is now advancing. So far we have completed morphotyping the species from Kakamega Forest (Kenya) and Budongo Forest (Uganda). Detailed statistical analysis of these data will be carried out when confirmation by foreign experts of most of the morphospecies is established. These studies will be accompanied with the study of some smaller collec-

INSTITUTIONAL NEWS (continued)

tions mainly from Uganda and Kenya. Also noteworthy is that we got in contact with persons who did some fogging of typical savannah trees in both Ivory Coast and Tanzania. These samples will also be looked at in the future to compare with that of typical rainforest trees. The Tervuren Museum Arachnological Team is also planning a sampling campaign. In November we organized a 20-day field trip to Ghana where some trees in both primary and secondary rainforests were sampled using the pyrethrum knockdown method (in collaboration with Dr. Peter Kwapong, University of Cape Coast). Next year, we plan a larger sampling effort in Congo DR (Kisangani) and Congo-Brazzaville.

MORE NEWS FROM AFRICA: Jean-Louis Juakalay (RD Congo) is writing up his PhD on the spider fauna of Masako Forest; **Benoit Nzigidahera** is still busy with his study on the forest spiders of Burundi and **Peter Kwapong** is still busy with spiders in Ghana. No news from **Negusu Aklilu** from Ethiopia.

CALIFORNIA

California Academy of Science
Team leader: Dr Charles Griswold

Hannah Wood is completing her MSc at San Francisco State University (SFSU). This is a revision and phylogenetic analysis of assassin spiders the *gracilicollis* group of *Eriauchenius* (Archaeidae). She describes 14 species,
9 new, based significantly on new material derived from the CAS biodiversity survey of Madagascar. A phylogeny based upon molecular and morphological data supports the monophyly of the gracilicollis group, identifies distinct eastern and western clades within Madagascar, and suggests that the extremely elongate cephalothoracic "neck" has arisen in parallel at least twice within
Archaeidae. Her research will take her to Madagascar and South Africa during December 2005 to March 2006.

Daniela Andriamalala continues with her MSc at SFSU studying Madagascar jumping spiders. She is revising the balline genus *Padilla.* There may be more than 12 species in Madagascar. She will investigate the evolution of and possible convergence in male secondary sexual characters, courtship behaviors, and lifestyles in these spiders.

Jeremy Miller has joined CAS as the Schlinger Foundation Postdoctoral Fellow in Entomology. He is working on a world revision and phylogenetic analysis of the widow spiders *Latrodectus* (Theridiidae). This research will take him to Madagascar and South Africa during January to March of 2006. Jeremy is also studying Madagascar spiders and has already discovered the first Synaphridae from Madagascar.

Charles Griswold continues work on Madagascar phyxelidid spiders and has also coauthored a study of the morphology and phylogeny of entelegyne spiders. This study features African exemplars of the Oecobiidae, Eresidae, Phyxelididae, Deinopidae, and Desidae. He is also still working on Cyatholipidae, Phyxelididae and Zoropsidae (including *Griswoldia* and *Phanotea*).

Diana Silva Dávila continues her research on Madagascar ctenid and sparassid spiders. She recently published a revision of the rare sparassid genus *Chrosioderma*.

Darrell Ubick hopes to continue his research on Madagascar oonopid spiders. Although not relevant to Africa, Darrell has also recently described the first coelotine amaurobiids with cribella and that occur in western North America.

SLOVENIA

Slovenian Academy of Sciences and Art
Slovenia
Dr Matjaz Kuntner : Matjaz has now three nephilid papers in press with some more ready for submittion. He is now busy with nephilid molecular phylogeny, the evolution of sexual traits including epigynal plugging and the evolution of phenotypic plasticity.

ZIMBABWE

Moira Fitzpatrick at the National Museum of Zimbabwe is busy publishing data from her PhD thesis on the genus *Zelotes* of the Afrotropical Region. She is also busy with surveys in Zimbabwe. Zimbabwe has a rich spider fauna although there are only 202 species formally recognised as occurring in this country. Many of the habitat types that occur in Zimbabwe, such as Mopane, Dry Miombo, *Acacia*/*Combretum* and Afromontane are representative of habitats found mainly north of the Zambezi River. The arachnid collection of the Natural History Museum, Bulawayo, with over 200 000 spider specimens, covers much of Zimbabwe.

Meg Cumming: "The problems of life in Zimbabwe finally overshadowed arachnological activities this year. Nor have spiders themselves had a vintage season, due to a biting drought which decimated insect populations. The Colloquium in Bloemfontein was the highlight of the year but it was mostly downhill from there. Spider activities centred on collating data and collecting spiders, although travel around the country was impossible due to the non-availability of fuel. I tried to mop up previously uncollected species in my garden, concentrating on very small spiders and on nocturnal species. With Tony Russell-Smith I am planning to bring out a paper on spiders in a one-hectare Harare garden next year, while Wanda Wesolowska and Meg continue to collaborate on the salticids in the same garden. I am also busy with training and gave a well-attended spider lecture in Harare".

LESOTHO

Charles Haddad reports: As part of the African Arachnid Database (AFRAD) projects, checklists of the arachnid faunas of various countries are being prepared. Lesotho is one of the smallest countries in Africa, with a surface area of approximately 30 300 square km, and is landlocked along all its borders with South Africa. About one quarter in the west is lowland

INSTITUTIONAL NEWS (continued)

country, varying in height from 1500 to 1600 m a.s.l., while the remaining three quarters form the highlands, ranging between 2000 and 3400 m a.s.l. Until now, very little was known of the arachnid diversity, except for sparse records in taxonomic papers. Two intensive surveys were conducted in Southern Lesotho" (CMBSL, November 2003) recently, to determine the arachnid fauna associated with islands and the catchment area of the Mohale Dam (MD) in central Lesotho (March and December 2003), and of mountains in southern Lesotho for the project "Conserving Mountain Biodiversity. Sampling was carried out primarily by rock turning and sweep-netting, with beats and leaf litter searching, where possible. A total of 240 species of spiders (40 families) are now known from Lesotho, including 109 spp. from 31 families from MD, 152 spp. from 34 families (CMBSL), and 100 spp. from 34 families (ARC – PPRI database). Opiliones are represented by 7 species in two families, Pseudoscorpiones by 5 species (1 family) and Scorpiones by a single species, *Opistacanthus validus* (Scorpionidae). It is likely that a large number of additional records will be known following completion of the biodiversity surveys that form part of the Maluti-Drakensberg Transfrontier Park project. Additional material from western Lesotho collected by **Gregorz Kopij** previously a staff member of the National University of Lesotho will also add to the knowledge of the arachnid diversity of the country.

SWAZILAND

Ansie Dippenaar-Schoeman reports: From the AFRAD database 22 species of spiders are presently known from Swaziland**.** A collection of unidentified material still need to be sorted.

NAMIBIA

Gobabeb Training and Research Centre
Team leader: Dr Joh Henschel

Gobabeb has continued to support arachnological research in Namibia. Our resident spiderman, **Thomas Nørgaard**, completed his fieldwork on the long-distance navigation and orientation of the Dancing White Lady spider *Leucorchestris arenicola*. Thomas is now busy at the University of Zürich churning out papers that will contribute to his PhD thesis. **Tharina Bird** from the National Museum of Namibia completed a year of pitfall trapping solifugids near Gobabeb and is now analyzing these data. Fieldwork was also completed on *Stegodyphus dumicola* near Windhoek by **Trine Bilde** of the University of Åarhus, Denmark, and **Yael Lubin** of Sde Boqer, Israel, and several of their students and assistants. Gobabeb provided guidance to **Greta Binford** in her study of the systematics of the Sicariidae. In the previous summer Gobabeb completed the 17th year of long-term population studies of the corolla spider, *Ariadna* crf *masculina*, the spoor spider, *Seothyra henscheli*, and the dancing white-lady spider, *Leucorchestris arenicola*.
The Gobabeb Training & Research Centre was officially inaugurated in May 2005 by the Right Honourable Prime Minister Nahas Angula in celebration of its development under the Joint Venture Agreement between the Ministry of Environment & Tourism and the Desert Research Foundation of Namibia. This strengthens Gobabeb's role to support research, and arachnologists are welcome to make use of this opportunity.

SOUTH AFRICA

ARC-SPIDER RESEARCH CENTRE

Team leader: Dr Ansie Dippenaar-Schoeman
The ARC team this year consisted of Ansie, Annette van den Berg, Almie van den Berg (in part), Elizabeth Kassimatis and Connie Anderson. Ian Engelbrecht joined the team for the last six months of 2005 to work on the scorpions in the collection.

TAXONOMIC RESEARCH: Ansie continues her work on the systematics and ecology of Afrotropical Thomisidae. Several short papers on the genera *Felsina, Hewittia* and *Cynathea* are in progress. The first papers on the thomisids of Yemen will be published in the Fauna of Arabiain 2006 . An identification manual on the Thomisidae of Southern Africa is progressing slowly. She was also involved in the description of a new bolas spider *Cladomelea debeeri* and revision of genera of the hersiliids with Stefan Foord.

IDENTIFICATION SERVICES: A total of 5600 spiders were identified for 23 clients which included: the Universities of Venda, Limpopo; Pretoria; Free State, KwaZulu-Natal and Transkei.; the Gauteng Nature Conservation and ARC projects. A total of 65 identifications were done for the public.

NATIONAL COLLECTION: Time were spend to clean the data while upgrading the present ACCESS database to a MYSQL database. New entries for the year 2005 reached a record number of 2500 accessions adding on average 10 000 new specimens to the collection.

STUDENTS: Ansie was involved in training and mentoring several students from the Universities of Venda, Limpopo, Pretoria, Transkei and the Free State.

COLLECTING TRIPS: Four collecting trips to Tswalu Game Reserve in the Northern Cape, Acacia Lodge near Thabazimbi, Ezemvelo near Bronkhorstpruit and Thanda Game Reserve in KwaZulu-Natal were undertaken by Ansie while Ian Engelbrecht visited the Kruger National Park in October to collect specimens as part of the KNP arachnid project.

SURVEYS: The survey of the spiders of Swartberg Nature reserve has been published as well as an article on the spiders from avocado orchards. Surveys of the fauna of Lesotho, Swaziland, Helsgate (KwaZulu-Natal), Tswalu Game Reserve, Ndumo Game Reserve and Tembe Nature Reserve continue. Other projects such as spiders from genetically manupulated crops like Bt maize and cotton are underway or have been completed. (see publication and SANSA).

DATABASES: A lot of data have been entered into the African Arachnida Database (AFRAD) and the

INSTITUTIONAL NEWS (continued)

South African National Survey of Arachnida databases. A proposal have been submitted via the South African Biodiversity Information Facility to obtain funds to employ personnel to help to enter data.

SPIDER EDUCARE PROGRANMME: A total of 23 talks;8 lectures, 3 courses, 21 radio talks and 5 TV presentations have been given this year.

VISITORS: We received visitors from Germany (Dirk Kunz), Belgium (Rudy); UK (David Penney and Paul Selden) and USA (Arthur Chapman).

SOUTH AFRICA—BIOTA

An assessment of spider diversity in Soebatsfontein (Northern Cape Province) - A contribution to the understanding of the distribution and ecology of spiders in South Africa

Dr Ute Schmiedel[1] & Reginald A. Christiaan[2]
[1] *BIOTA Southern Africa*, Biocentre Klein Flottbek and Botanical Garden, University of Hamburg, Ohnhorststrasse 18, D-22609 Hamburg, Germany, Uschmiedel@botanik.uni-hamburg.de
[2] Para-Ecologist, P.O. Box 50, Soebatsfontein 8257, South Africa

The interdisciplinary and international biodiversity research project *BIOTA Southern Africa* initiated an assessment and ecological study of spiders at Soebatsfontein in the western Namaqualand (Northern Cape Province, South Africa). The project aims at an inventory of spider species at the study site taking different habitats into account (low or dense vegetation, rocky or sandy-loamy substrate etc.).

The aim of *BIOTA Southern Africa* (www.biota-africa.org) is to assess and monitor the impact of land-use and global climate change on biodiversity along a climatic gradient from the Cape (high winter rainfall) to the Kavango (high summer rainfall) covering semi-arid and arid winter and summer rainfall areas. The monitoring is conducted on standardised study sites of 1x1 km² in size, so called Biodiversity Observatories.

Eleven different subprojects cover various different disciplines in this study (i.e., remote sensing; soil science; mycology; botany: phycology, lichenology, seed plants; zoology: ants, termites, beetles, dragonflies, pollinators, small mammals; socio-economy and modelling).

In October 2004 *BIOTA Southern Africa* employed and started to train eight para-ecologists. Those are members of rural land-user communities in the vicinity of the BIOTA Biodiversity Observatories. The para-ecologists work with the researchers in the field, conduct monthly or weekly observations and measurements (e.g., on plant phenology, insect trapping) during the absence of the researchers but may also fill some gaps with respect to the assessment of different organism groups. The spider project in Soebatsfontein is one example of how para-ecologists are initiating their own biodiversity project within the frame of *BIOTA Southern Africa*. The

Ansie with students attending the course at Ezemvelo.

INSTITUTIONAL NEWS SOUTH AFRICA

para-ecologist R.A. Christiaan will conduct the practical part of the study supervised by specialists (Dr. A. Dippenaar-Schoeman, Dr. Joh Henschel).

The following trapping methods will be applied on a monthly base: a) Pitfall traps set out at four different vegetation types of the BIOTA Biodiversity Observatory at Soebatsfontein, separated into diurnal and nocturnal trapping, b) Sampling of plant-dwelling spiders and c) selective collection of web-dwelling spiders.

The spiders will be sorted and preliminarily identified by R.A. Christiaan, sent over to the Plant Protection Research Institute of the Agriculture Research Council in Pretoria where they will be finally identified and hosted in the National Collection of Arachnida.

The resulting data on diversity and composition of spider species during the course of the year and within different habitat types shall be related to other monitoring data such as weather data (of the automatic weather station at the site), the phenology of plants and humidity of soil which are also gathered on a monthly base as well as to the annually assessed information on plant species composition on the BIOTA Biodiversity Observatory. Beyond this, the survey will provide valuable information to the South African National Survey of Arachnida (SANSA).

Besides the scientific interest in the study, the study will also have an important educational aspect. Since the practical parts of the study will be conducted by a member of the Soebatsfontein community. He will also participate in educating the people in the village. Questions like what kind of spiders occur in the area, where and how do they live, what role they play in the ecosystem and whether or not they are harmful to humans can be answered. As part of his job as para-ecologist, R.A. Christiaan will integrate the gathered information into the environmental education at the local Primary School.

Soebatsfontein and its flowers in spring

GAUTENG NATURE CONSERVATION

Marianne Forsyth

Gauteng Nature Conservation of the Gauteng Department of Agriculture, Conservation and Environment (GDACE) initiated the Biodiversity GAP analysis project (BGAP Project) in June 2001. This project was initiated n response to the need for the identification and mapping of priority areas in the province where development, habitat transformation and fragmentation should be discouraged, and conservation efforts should be focused. The BGAP project objective is to produce a GIS-based biodiversity database compiled by overlaying spatial information on each of the major groups of fauna and flora and other important biodiversity components.
Methods involve collation of all existing information from museums and herbaria, networking with external experts, literature surveys to establish appropriate methods, field surveying, field monitoring of biodiversity, data analysis and interpretation. Within the BGAP Project, arachnids have been identified as a priority group for conservation efforts and they have been included in the conservation planning exercise to date.
Vuyo Mpumlwana is the new technician that was appointed to the Invertebrate programme at GNC—welcome Vuyo (ed).

NEWS FLASH…….
Marianne decided to resign from her full timer job at GNC the end of this month BUT she will continue from home to coordinate the project until they appoint somebody

KWAZULU-NATAL

There are several surveys presently undertaken in KZN by students of the University of KwaZulu-Natal, University of the Free State, University of Transkei,the ARC-Spider Centre and the Spider Club (see SANSA).
Sue van Rensburg, chief scientific officer at Hluhluwe Game Reserve, is interested to organize a comprehensive collection of arachnids in the park, provisionally during April 2006. Anybody who is interested to join this, can contact her at vanrenss@kznwildlife.com

NATIONAL MUSEUM, BLOEMFONTEIN

Leon Lotz

Leon is presently busy with the following projects: the Afrotropical genera *Cheiracanthium* and *Cheiramiona* (Araneae: Miturgidae); the Afrotropical family Archaeidae (Araneae); the scorpions (Arachnida) of the Free State Province, South Africa; the Afrotropical genera of the family Sicariidae (Araneae); the spiders (Araneae) of the Free State Province, South Africa; invertebrates of the National Botanical Garden, Bloemfontein, Free State Province, South Africa. A co-project with the Entomology Department of the National Museum.

He is also involved in the identification of spiders, scorpions and opilionids for the following projects that are not run by the Arachnology Department: Patterns in the soil composition and structure, recovery of vegetation, and changes in mite, insect, spider and small mammal communities after fire in a grassland ecosystem, Erfenisdam Nature Reserve, Free State Province.

INSTITUTIONAL NEWS SOUTH AFRICA

An assessment and ecological interpretation of the terrestrial invertebrate fauna in the South African portion of the Maloti-Drakensberg bioregion.

Publications in review or nearing completion:

A new species of *Cheiramiona* (Araneae: Miturgidae) from Namibia.

The distribution of harvestman (Arachnida: Opiliones) in southern Africa - a review.

Afrotropical Archaeidae (Araneae): 3. The female of *Archaea cornutus* and a new species of *Afrarchaea* (Arachnida: (Araneae).

The scorpions (Arachnida) of the Free State Province, South Africa.

The Afrotropical species of the genus *Cheiracanthium* (Araneae: Miturgidae).

SPIDER CLUB OF SOUTHERN AFRICA

Part 1: Ian Engelbrecht

The Spider Club has enjoyed a very exciting and eventful 2005. In 2004 the decision was taken that the club should start directing its activities to making a contribution to arachnid science and conservation in South Africa while at the same time allowing its members the chance to grow and develop their interest while still having a lot of fun. And that is just the way things have been going.

In March the club ran a field outing to Pilanesberg National Park, a resounding success! We were hosted like royalty, being spoilt with game drives in open top game viewing vehicles and escorted by two very knowledgeable young game wardens. We managed to turn up almost 75 arachnid species for the reserve, including some very interesting new finds. A great time was had by all.

In April we visited the Weenen and Spioenkop Nature Reserves in KwaZulu-Natal. While this trip wasn't as well attended we still turned up some fascinating creatures, including prickly tailed rock scorpions and a stunningly beautiful *Platythomisus* crab spider. This was a real rustic style camping weekend, but the camp site at Stony Ridge, just outside Weenen Game Reserve, was unanimously voted one of the most beautiful the Spider Club has visited yet!

May saw us try a new approach to presenting a spider identification course – student style! Wits University hosted the course in their Life Sciences Museum, the perfect venue with microscopes, reference books and teaching facilities aplenty. The course was presented by Astri and John Leroy, Caroline Crump and Ian Engelbrecht. The first day involved getting to know the creatures a little better, working through keys and examining specimens under the microscopes.

There was even a quiz session afterwards where people got the chance to test out their new 'IDing' skills. The next day we went out to Melville Koppies Nature Reserve to see where spiders live and what they do. This course was a great success, and we got many keen new members from it.

Our June AGM saw a new constitution, a new code of ethics and a new committee for the club. Afterwards and in celebration of the clubs' 30th birthday we were treated to a lamb on the spit courtesy of one of our members, and a great time was had by all. With the club on the up and up we look forward to what 2006 will hold…

Part 2: Astri and John Leroy

SPIDERS IN A BUTTERFLY RESERVE

The Ruimsig Butterfly Reserve was proclaimed to preserve the habitat of a Red Data species butterfly so I hope the spiders don't cause its extinction! Anyway, in collaboration with Gauteng Nature Conservation of the Gauteng Department of Agriculture, Conservation and Environment (GDACE) the survey of the Ruimsig Butterfly Reserve, in Roodepoort continues. Astri is collecting all invertebrates for GDACE but personally concentrating on arachnids. So far the most interesting specimens are a juvenile *Pycnacantha tribulis* photographed but not collected last summer and recently some strange, tiny, male mygalomorphs.

CAVE INVERTEBRATES

Also with GDACE but under the auspices of the cave specialist group Astri is collecting invertebrates from caves and karst in The Cradle of Humankind, Gauteng. There are more than 2000 caves in the Province so it may take a while! The cave specialist group plans to make comparisons between pristine and exploited caves.

BOTANICAL SOCIETY

John and Astri take members of the public on "spider walks" in the Walter Sisulu National Botanical Garden and the Lowveld National Botanical Gardens to raise funds for The Botanical Society.

TRAINING COURSES

The Leroys present spiders and the lesser known arachnids (excluding ticks and scorpions) to various field-guide training organisations and other interested groups. We helped with the identification course at the University of the Witwatersrand on 2nd & 3rd May and gave two labs to the 2nd year B.Sc. students at the University of Limpopo on 26th of August. I don't know about the students but it was a huge learning curve for us and a little nerve racking because other students rioted that day!

PUBLICATION

A short communication "Notes on the natural history of a trapdoor spider *Ancylotrypa* Simon (Araneae, Cyrtaucheniidae) that constructs a spherical burrow plug" has been accepted by the Journal of Arachnology for the Ghent congress issue.

UNIVERSITY OF FORT HARE

Team leader: Jacques van Heerden

Jacques has been collecting pseudoscorpions for the last seven years, particularly in rocky habitats in the Eastern Cape and Free State. **Natasha Nondula** a MSc student started with her MSc last year and is working on aspects of the distribution, ecology and micro-anatomy of the genus *Horus*, of the family Olpiidae, which is found inter alia in mudstone and sandstone cracks in the Beaufort, Ecca and Dwyka. We have now also located the genus under banded ironstone rocks in the Prieska district and have recently collected specimens in Hluhluwe Game Reserve in Zululand. Specimens from eleven localities have been sent for DNA analysis and we are awaiting the results.

With the aid of Johan (J.C.) Loock, of the Geology De-

INSTITUTIONAL NEWS SOUTH AFRICA

partment at the the University of the Free State, we were able to pinpoint the type locality for *Horus obscurus* (Tullgren), the first described species of the genus, near Bothaville in the Free State. A paper which describes the site and gives more information on the collector, Dr H Brauns, has been accepted by the Hamburg Museum, where the type is held, and will be published next year in their *Entomologische Mitteilungen.*

We also submitted a paper on the distribution of *Horus* (a genus confined to southern Africa) to *African Entomology* and Jacques submitted a technical note to the same journal on the preservation technique for small arachnids which is less hazardous and more economical than the system currently used by museums.

We will participate in the survey as planned by Sue van Rensburg, chief scientific officer at Hluhluwe Game Reserve, provisionally during April 2006. Anybody who is interested to join this, can contact us at jvanheerden@ufh.ac.za.

UNIVERSITY OF THE FREE STATE
Team leader: Charles Haddad

Charles Haddad continues his work on the systematics and ecology of Afrotropical Corinnidae as part of his PhD. Since the *Graptartia* revision was published last year, several short papers on the genera *Corinna*, *Corinnomma*, *Cambalida* and the new tracheline genus *Spinotrachelas* have been submitted. The revision of *Copa* is progressing slowly due to other work commitments, but more than 30 new species will be described, mainly from Madagascar.

Robin Lyle, an Entomology Honours student, has revised the corinnid genus *Thysanina*, and the results will be submitted for publication soon. She will continue her MSc studies next year on the systematics of Afrotropical tracheline sac spiders.
Surveys of the fauna of Lesotho, De Hoop Nature Reserve, Erfenis Dam Nature Reserve and Ndumo Game Reserve continue. New projects were initiated at Ndumo at the start of 2005, including studies on spider communities in different woodland and forest types, ethology of the common ant-mimic *Merenius alberti*, and studies on a new termitophagous species of jumping spider of the genus *Stenaelurillus*. Other projects are also planned for the future for this reserve. The reserve checklist is nearly complete, and nearly 380 species are now recorded from the reserve.
A survey of the arachnid fauna of the Erfenis Dam Nature Reserve near Theunissen in the Free State was recently initiated, as is a joint venture between the U.F.S. and National Museum. The main focus of the study is to determine the impact of controlled burning on epigeic spider communities, but a checklist of the reserve will also be published as other sampling methods are incorporated in the survey. The checklist of the spiders of De Hoop is entering the final phase, and the results will be published following a last sampling during 2006. Approximately 200 species have been recorded from the reserve so far.

UNIVERSITY OF KWAZULU-NATAL
Team leaders: Michelle Hamer & Rob Slotow

MALOTI-DRAKENSBERG TRANSFONTIER PARK
Michelle and her team is presently involved in Terrestrial invertebrate survey and associated research projects in the Maloti-Drakensberg Transfrontier Park.
The project was initiated by the Inland Invertebrate Initiative, are funded by the World Bank and administered by the University of KwaZulu-Natal.
The aims of the project are to provide basic inventory information on terrestrial invertebrates in the Drakensberg using a stratified survey approach; to advise on invertebrate diversity conservation planning; to advise on the possible effect of human intervention on biodiversity; to provide the foundation for research into the processes affecting invertebrate diversity; to provide inventories with species level identification for selected invertebrate taxa for each location and to provide where possible conservation status for each species and undertake IUCN Red-listing of key threatened species.

The project is designed around a strategy of sampling of a large number of sites over a relatively short period of the summer. This is to control for seasonal variation in diversity that will allow data collected on the survey to be compared across the survey area, compatible with surveys of other survey projects (e.g. vertebrates), and to be ecologically referenced.

This strategy will miss diversity through the rest of the year, but a key principle of this project is that it will not completely sample the diversity, but rather will focus on key invertebrate taxa which are important in terms of conservation, functionality, and have high potential as indicators of ecological (rather than biodiversity) processes.
The project will only focus on some invertebrate groups. These are groups that are (1) easy and cost effective to sample using repeatable methods, (2) that have experts that are willing to identify them, (3) represent a range of functional groups, (4) are likely to be indicators of ecological processes, (4) have high levels of endemism and (5) will most likely be of high conservation priority in the Drakensberg. Spiders are part of the taxa to be sampled and identified with the help of Ansie, Charles and Leon.

Johanna Swayne: her MSc was upgraded to a PhD. She is continuing with her invertebrate (spiders, terrestrial molluscs, millipedes, centipedes, earthworms) sampling in Mariepskop indigenous forests with the help of Rebecca Stirneman of Global Vision International (GVI) and the GVI volunteers. She has also sampled invertebrates in some indigenous forests in the Malelane area, thanks to the kind permission of Sherlock Farm and Serenity Mountain Lodge. In December and early next year she plans to continue sampling at Mariepskop (with GVI's help) and at Sherlock. She also plans to sample invertebrates in several indigenous forests in Mpumalanga (but the locations are still to be determined and the permits organized).

Saskie Lovell: I am currently working on a paper relating to sampling methods using a multi-taxa approach, in which spiders (Thomisidae, Araneidae & Oxyopidae) are being assessed. The analysis suggests

INSTITUTIONAL NEWS SOUTH AFRICA

that the combination of using a quantified number of tree beating, sweep netting and colour pan traps has been effective in sampling an estimated 77% of the total species richness. Work so far has certainly highlighted the difficulties in using spiders for community structure analyses due to the presence of over whelming number of singletons. In the future we will be looking at identifying potential surrogates to represent spiders for conservation planning, and the link between spider species (morpho-species) and tree species (although this work is in its infancy).

UNIVERSITY OF THE LIMPOPO

Team leader: Susan Dippenaar

Under supervision of Susan Dippenaar and Ansie Dippenaar-Schoeman two students have completed their BSc (Hon) projects on spiders and they are presently busy with their MSc's.

Thembile Khoza: The biodiversity and species composition of the spider community of Marion Island, was undertaken as her BSc (Hons) project. Marion Island, the larger of the Prince Edward Islands, lies in the sub-Antarctic biogeographic region in the southern Indian Ocean. From previous surveys, four spider species are known from Marion. The last survey was undertaken in 1968. During this study a survey was undertaken over a period of four weeks (11 April – 30 May 2004) on the island to determine the present spider diversity and to record information about the habitat preferences and general behaviour of the species present. Three collection methods (active search, Tullgren funnels and pitfall traps) were used, and spiders were sampled from six habitat sites. A total of 430 spiders represented by four families were collected, *Myro kerguelenesis crozetensis* Enderlein, 1909 and *M. paucispinosus* Berland, 1947 (Desidae), *Prinerigone vagans* (Audouin, 1826) (Linyphiidae), *Cheiracanthium furculatum* Karsch, 1879 (Miturgidae) and an immature Salticidae. The miturgid and salticid are first records. *Neomaso antarticus* (Hickman, 1939) (Linyphiidae) were absent from samples, confirming that the species might have been an erroneous record. (see list of publications). Tembile won the prize for best student paper at the last colloquium.

Mokgadi Modiba: A survey of the spiders from Sovenga Hill, an inselberg in the Savanna Biome, Limpopo Province, South Africa was undertaken as part of her BSc (Hons) project. During April and May 2004 five different collecting methods were used to sample spiders from four habitat types on Sovenga Hill, an inselberg situated in the Savanna Biome, near Polokwane, in the Limpopo Province of South Africa. A total of 793 specimens represented by 29 families, 62 genera and 76 species were recorded over the two-month period. The Thomisidae was the most abundant (n=167) representing 21.1 % of all spiders sampled, followed by the Gnaphosidae (n=101) with 12.7 % and the Lycosidae (n=77) with 9.7 %. The most abundant species was a thomisid *Tmarus comellini* Garcia-Neto (n=82), representing 10.3 % of the total, followed by a clubionid *Clubiona godfreyi* Lessert (n=66) with 8.3 %. The Thomisidae was the most species rich family with 12 species, followed by the Gnaphosidae with 11 species and the Araneidae with 10 species. Of the species collected 83.9 % were wandering spiders and 16.1 % web builders. This is the first quantitative survey of the Savanna Biome in the Polokwane area.

2005: Thembile Khoza and **Mokgadi Modiba** are presently busy to determine the biodiversity and species richness of the spiders (Araneae: Arachnida) n the Polokwane Game Reserve, Limpopo Province as part of their MSc studies. They will collect specimens from two different vegetation types: *Acacia tortilis*/*Themeda triandra* and *Acacia rehmanniana* sites in the Polokwane Game Reserve over a period of one year. Only two months of collecting remain.

UNIVERSITY OF PRETORIA

Team leader: Dr Berendt van Rensburg

Berendt is involved with Stefan Foord of the University of Venda and Ansie Dippenaar-Schoeman in a Thuthuka project of the NRF to determine the diversity of the Savanna Biome.
One of his students **Kyle Harris** is busy as part of his MSc study to assess and monitor local scale impacts of prickly pear (*Opuntia stricta)* on arthropod assemblages in the Kruger National Park, South Africa.
The University of Pretoria in conjunction with the Invasive Alien Research Programme (IAS) in the Kruger National Park (KNP) has initiated a research project in order to determine the effect of invasive plants on invertebrate biodiversity. The aims of the project are as follows:

- »To examine habitat specificity of beetles and spiders and variation in these assemblages, within a habitat system characterized by different levels of prickly pear (*Opuntia stricta)* invasions.
- »To identify groups of species that are characteristic of each *O. stricta* invasion level (indicators), as well as species that may be used to monitor changes in invasion levels (detectors). Detector species will be used to predict change in the intensity of *O. stricta* invasions.

The study site is found in the Skukuza region of the KNP. Three different infestation levels of *O. stricta* have been selected, a high-infestation site, a medium infestation site and a site completely free of *O. stricta*. Twenty-five pitfall traps have been placed within each treatment and have been covered with a steel grid to prevent animals (mainly baboons and hyenas) removing the contents of the trap. Sampling occurs bi-monthly over a twelve-month period and during each sampling month; the traps are left open for ten days and cleared every second day. In addition to the pitfall traps, active searching and leaf litter sifting methods are employed to search for spiders.
To date, two months of sampling has been completed. With the help of Ansie Dippenaar-Schoeman of the ARC, eleven families of spiders have already been identified. Fifteen species of coleopterans have also been identified.
A major component of the South African National

INSTITUTIONAL NEWS SOUTH AFRICA

Study site in the Kruger National Park at Skukuza showing the stands of Opuntia stricta

Pittraps used

Parks mission statement is to maintain biodiversity in all its natural facets and fluxes. The results of this study will therefore benefit KNP, as it will highlight the impact of *O. stricta* on invertebrate biodiversity and will contribute to the park's long-term strategy to manage *O. stricta*. The results will also be incorporated into the South African National Survey of Arachnida (SANSA), which aims to make an inventory of the arachnid species in the different biomes of South Africa.

Magdel Mellet; under supervision of At Schoeman completed her MSc study. Part of her study was to determine the effect of Bt-cotton cultivation on spider (Arachnida: Araneae) populations in Marble Hall, Mpumalanga, South Africa. A survey to determine the effect of Bt-cotton and endosulfan applications on spider populations was conducted during two cotton growing seasons (2001/2002 and 2002/2003). Plant dwelling spiders were counted while scouting the plants during both seasons. The ground dwelling spiders were collected during the second season with pitfall traps and identified to species level. Bt-cotton, containing and expressing genes from the soil bacterium *Bacillus thuringiensis*, is specifically toxic to lepidopteran larvae and no direct negative impact on predators such as spiders, is expected. *Pardosa crassipalpis* (Lycosidae), *Trabea* sp. (Lycosidae), *P. clavipalpis* (Lycosidae) and *Steatoda erigoniformis* (Theridiidae) were the most abundant ground dwelling species collected from the pittraps and Lycosidae, Theridiidae and Linyphiidae were the most abundant families caught. Neither Bt-cotton nor the application of endosulfan had apparent negative effects on soil or plant dwelling spiders in the field.

Sonja Maartens: under supervision of Willem Ferguson surveyed grassland in the Graskop region for her MSc and the spiders was one of the groups she has collected. She is now very interested in the spiders and is planning to do her PhD on spatial distribution patterns.

UNIVERSITY OF VENDA

Team leader: Dr Stefan Foord

Stefan Foord and his team is busy with a survey of the arachnids of the Savanna Biome. The University of Venda has also provided funding for a project that will test the use of spiders as biodiversity surrogates. The work will be done in collaboration with Dr Ed Stam from the School of Environmental Sciences at UNIVEN. Fieldwork will also start in November this year. All these results will contribute to a larger macro-ecological study of spider diversity in the Savanna Biome.
Stefan Foord completed his PhD in systematics at the University of Pretoria in the beginning of this year. His thesis focused on Afrotropical hersiliids and was under supervision of Prof Clarke Scholtz (University of Pretoria) and Prof. Ansie Dippenaar-Schoeman (PPRI-ARC).
Stefan was also fortunate enough to go on a research visit to the Museum für Naturkunde (Berlin) and the Senckenburg Museum (Frankfurt) in August this year funded by the National Research Foundation and DAAD.

Maria Mafadza one of his MSc students, is in the final stages of her MSc, which includes a comparative survey of spider assemblages in five habitats (grasslands, short and tall forests, open and closed woodlands) in the Soutpansberg. Her work will provide a baseline assessment of spider diversity in this complex inselberg. Maria has completed her sampling and she, Ansie and Annette are presently trying to get all the specimens identified. Maria spend a week in Pretoria working on the material.

INSTITUTIONAL NEWS SOUTH AFRICA

UNIVERSITY OF TRANSKEI
Team leader: Dr Michael Somers

One of Michaels's students **Mandisa Mgobozi** completed her BSc project determining the relationship between spider species density (abundance), diversity and selected habitats in Dwesa Forest.
No work has been done on spider species density and abundance in Dwesa in the former Transkei area, South Africa. Studies have shown that there are clear associations between spider diversity and the structural diversity of the habitat. This study, investigates if any relationship exists between species density (abundance) and diversity in relation to habitat diversity. Four habitat types were identified and pitfall trapping was employed as a sampling method. It was then shown, that a relationship does exist between habitats, families and number of species. Alpha, beta & gamma diversities were calculated for the different habitats and variation in diversity when comparing different habitats was observed. Also, when Simpson's and Shannon-Wiener indices were employed, variation in habitat diversities was observed. The habitat with the highest abundance of spider specimens retrieved did not have the highest diversity. Thus, increasing the number of specimens does not necessarily increase the diversity of a habitat. The results of this study will be published soon.

Mandisa's MSc project looks at the affects of an invasive weed on the diversity and abundance of spiders in an African savanna. Arthropods are important as food for a wide range of vertebrates and invertebrates. Spiders have habitat specificity and are thus more sensitive to change at much finer scales than larger organisms because they require smaller patches for their survival. Thus, spiders can be used as indicators of environmental quality, because they show clear response to disturbance and because they are abundant and easily sampled.

This study will be using spiders as bio-indicators on the effect of *Chromolaena odorata* on invertebrate diversity, mainly focusing on spiders. Nearly all the protected areas in KwaZulu-Natal have already been

invaded by this weed and it grows as an aggressive colonizer in different habitats in different parts of the world.
C. odorata invasion historical maps within the reserve will be analysed and areas that have been invaded for *ca* 20 years, *ca* 10 years and less than 1 year will be identified.
In addition, in areas that were infested *ca* 10 years ago, sites that were cleared less than 2 years ago and between 3-5 years ago will be identified.

There will be a total of 6 treatment sites including the control site. Each site in each treatment containing 10 pitfall traps, making a total of 360 pitfall traps, vegetation beating will also be employed. The sampling will be done seasonally. This study is anticipated to show the effect of *C. odorata* infestation durations on invertebrate fauna and determine if the system actually does rehabilitate after clearing of the weed.

Another aspect of this study is to determine the effects of mega ungulates on invertebrate diversity mainly focusing on spiders still. Exclosure plots have been employed that exclude different mega herbivores and were established nearly five years back. Three treatments will be employed: control fence- all animals present; rhino fence- excludes rhinos and all mega herbivores & complete exclosure- hare and larger herbivores excluded. There are five sites in Hluhluwe and five down at iMfolozi, each containing the three identified treatments, making a total of 15 treatments in Hluhluwe and 15 at iMfolozi. Hluhluwe and iMfolozi have different rainfall regimes and the different sites have different grass types i.e. lawn grass type; bunch grass type and mixed grass type. Each site will contain 10 pitfall traps, making a total of 300 pitfall traps and sweep netting as another sampling method will be employed. This study will determine the effects of mega herbivores on invertebrate diversity; compare the diversity and density patterns of spiders in relation to the different rainfall regimes of Hluhluwe and iMfolozi and also determine the difference between the diversity indices of the different grass types.

Mandisa Mgobozi at one of her study sites

NEW PUBLICATIONS ON AFRICAN ARACHNIDS

CLOUDSLEY-TOMPSON, J.L. 2005. A scorpion logo in the Ingessana Hills. *Newsletter of the British Arachnological Society* 102: 1-2.

CODDINGTON, J.A., GIRIBET, G., HARVEY, M.S., PRENDINI, L., & WALTER, D.E. 2004. Arachnida. Pp. 296-318. *In*: Cracraft, J. and Donoghue, M. (Eds.) Assembling the Tree of Life. Oxford University Press, Oxford.

CORRONCA, J.A. 2005. Re-description of the lycosiformis species group of *Anyphops* Benoit and description of two new species (Araneae, Selenopidae). *Journal of Natural History* 39: 1381-1393.

CORRONCA, J.A. 2005. Four new species of *Selenops* (Araneae, Selenopidae*)* and comments on the distribution of Afrotropical species*. Zootaxa* 1003: 33-44.

DIPPENAAR-SCHOEMAN, A.S. 2005. The button spiders of Africa. *Science in Africa*, May: 1-6 (www.scienceinafrica.co.za)

DIPPENAAR-SCHOEMAN, A.S. 2005**.** The wonder world of spiders. *Ques*t 4: 24-29.

DIPPENAAR-SCHOEMAN , A.S., **VAN DER WALT, A.E., LE ROUX, E. & VAN DEN BERG, A**. 2005. The spiders of the Swartberg Nature Reserve in South Africa (Arachnida: Araneae). *Koedoe* 48: 77-86.

DIPPENAAR-SCHOEMAN, A.S., VAN DEN BERG, A.M., VAN DEN BERG, M.A. & FOORD, S.H. 2005. Spiders in avocado orchards in the Mpumalanga Lowveld of South Africa: species diversity and abundance (Arachnida: Araneae). *African Plant Protection* 11:8-16.

DIPPENAAR-SCHOEMAN, A.S. & VAN HARTEN, A. (in press). The crab spiders (Araneae: Thomisidae) from mainland Yemen and the Socotra Archipelago: 1. Genus *Thomisus* Walckenaer, 1805. *Fauna of Arabia*

DORR, T. 2005. Zwei revisionen zur afrikanischen vogelspinnenfauna. *Arachne* 10(2): 32-37.

DRUCE, D., HAMER, M., SLOTOW, R. & PRENDINI, L. 2004. Checklist of millipedes (Diplopoda), centipedes (Chilopoda) and scorpions (Arachnida: Scorpionida) from a savanna ecosystem, Limpopo Province, South Africa. *African Invertebrates* 45: 315-322.

EDWARDS, R.L.; EDWARDS, E.H. & EDWARDS, A.D. 2003. Observations of *Theotima minutissimus* (Araneae, Ochyroceratidae), a parthenogenetic spider. *Journal of Arachnology* 2(31): 274-277.

FOORD, S.H. & DIPPENAAR-SCHOEMAN, A.S. 2003. Synthesis of spider diversity of the Soutpansberg. *In*: A First Synthesis of the Environmental, Biology and Cultural Assets of the Soutpansberg.

BERGER K., CRAFFORD J.E., GAIGHER I., GAIGHER M.J., HAHN N., AND MACDONALD I., (eds). Louis Trichardt, Leach Printers and Soutpansberg, Limpopo Biosphere Initiative. http://www.soutpansberg.com/workshop/synthesis/spiders

FOORD, S.H. & ENGELBRECHT, I. 2005. Invertebrate diversity of the Soutpansberg to Limpopo Biosphere Reserve Area. *In*: Biodiversity of the Soutpansberg to Limpopo Biosphere Reserve (eds.) van de Wiel, G.L.W., Gaigher, I.G. Proceedings of a workshop held at the Lajuma Mountain Retreat, 3 June 2005.

FOORD S.H. (in press). Cladistic analysis of the family Hersiliidae (Arachnida, Araneae) of the Afrotropical Region and the description of a new genus, *Prima*, from Madagascar. *Afrotropical Zoology*

FOORD, S.H. & DIPPENAAR-SCHOEMAN, A.S. 2005. A revision of the Afrotropical species of *Hersiliola* Thorell and *Tama* Simon with description of a new genus Tyrotama (Araneae: Hersiliidae). *African Entomology 13: 255-279.*

FOORD, S.H., DIPPENAAR-SCHOEMAN, A.S. 2005. First records of the genus *Neotama* Baehr & Baehr (Araneae: Hersiliidae) from the Afrotropical Region. *African Invertebrates*.

FOORD, S.H., DIPPENAAR-SCHOEMAN, A.S. (in press). A revision of the Afrotropical species of *Hersilia* Audouin (Araneae: Hersiliidae*). Zootaxa*

GALLON, R.C. 2005. On a new genus and species of theraphosid spider from Serpent Island, Mauritius (Araneae, Theraphosidae, Eumenophorinae). *Bulletin of the British Arachnological Society* 13: 175-178.

GALLON, R.C. 2005. A new species opf theraphosid spider from Southern Africa (Araneae,Theraphosidae, Harpactirinae) with distributional notes on other harpactirines. *Bulletin of British Arachnological Society* 13: 179-184.

GALLON, R.C. 2005. *Encyocretella olivacea* Strand, 1907, a senior synonym of *Xenodendrophila gabrieli* Gallon, 2003 (Araneae: Theraphosidae: Stromatopelminae) with a description of the male. *Zootaxa* 1003: 45-56.

GALLON. R.C. 2005. *Ashantia* Strand, 1905 is a junior synonym of *Euathlus* Ausserer, 1875 (Araneae, Theraphosidae, Theraphosinae). *Bulletin of the British Arachnological Society* 13: 199-201.

GRISWOLD, C. E., RAMIREZ, M.J. , CODDINGTON, J. & PLATNICK, N. 2005. Atlas of Phylogenetic Data for Entelegyne spiders (Araneae: Araneomorphae: Entelegynae) with comments on their Phylogeny. Proceedings of the California Academy of Sciences, 4th Series, vol. 56, Supplement II, pp. 1—324.

HADDAD, C. R., LOUW, S. VDM. & DIPPENAAR-SCHOEMAN, A. S. 2005. Spiders (Araneae) in ground covers of pistachio orchards in South Africa. *African Plant Protection* 10: 97-107.

HADDAD, C. R. (in press). A redescription of *Corinna natalis* Pocock, 1898 (Araneae: Corinnidae), Africa's

NEW PUBLICATIONS ON AFRICAN ARACHNIDS (continued)

largest dark sac spider, with natural history notes. *Journal of Afrotropical Zoology*.

HADDAD, C. R. & DIPPENAAR-SCHOEMAN, A. S. 2005. Epigeic spiders (Araneae) in pistachio orchards in South Africa. *African Plant Protection* 11:

HADDAD, C. R. & LOUW, S. VDM. (in press). Phenology, ethology and fecundity of *Heliophanus pistaciae* Wesoÿowska (Araneae: Salticidae), an agrobiont jumping spider in South African pistachio orchards. *African Plant Protection*.

HADDAD C R, DIPPENAAR-SCHOEMAN A S & PEKÁR S. (in press). Arboreal spiders (Arachnida: Araneae) in pistachio orchards in South Africa. *African Plant Protection.*

HADDAD, C. R. & DIPPENAAR-SCHOEMAN, A. S. 2005. Epigeic spiders (Arachnida: Araneae) in Nama Karoo grassland in the Northern Cape Province. *Navorsinge van die Nasionale Museum*, *Bloemfontein* 21: 1-10.

HUBER, B.A. & HOPF, S. 2004. Color dimorphism in adults and juveniles of *Buitinga safura* (Araneae, Pholcidae). *Journal of Arachnology* 2(32): 336-340.

JACKSON, R.R., NELSON, X.J. & SUNE, G.O. 2005. A spider that feeds indirectly on vertebrate blood by choosing female mosquitoes as prey. *PNAS* 102(42): 15155-15160.

JÄGER, P. 2005. Two strangers in Europe – Sparassidae recently discovered in England and Belgium (Araneae: Sparassidae). *Newsletter of the British Arachnological Society* 102: 13-14.

JÄGER, P. & KUNZ, D. (in press). An illustrated key to genera of the African huntsman spiders (Arachnida, Araneae, Sparassidae). *Sennckenbergia Biologica* 85 (2).

JOCQUÉ, R. 2003. Species of *Diores* (Araneae, Zodariidae) from the island Mayotte in the Comoro Archipelago. *Annls Mus Centr (Zool)* 291: 129-132.

JOCQUÉ, R., SAMU, F. & BIRD, T. 2005. Density of spiders (Araneae: Ctenidae) in Ivory Coast rainforests. *Journal of Zoology London* 266: 105-110.

KHOZA, T.T., DIPPENAAR, S.M. & DIPPENAAR-SCHOEMAN, A.S. **2005**. The biodiversity and species composition of the spider community of Marion Island, a recent survey (Arachnida: Araneae). *Koedoe* 48(2): 103-107.

LEHTINEN, P.T. 2003. Taxonomic notes on the Misumenini (Araneae: Thomisidae: Thomisinae), primarily from the Palearctic and Oriental regions. *Europian Arachnology* 1: 147-184.

LEROY, A. & LEROY, J. (in press). Notes on the natural history of a trapdoor spider *Ancylotrypa* Simon (Araneae, Cyrtaucheniidae) that constructs a spherical burrow plug. *Journal of Arachnology.*

LOTZ, L.N. 2004. Vals-skerpioene. *Culna* 59: 16.

LOTZ, L.N. 2005. Swept by Arachnophobia. *Nouveau* 11: 92-93.

MELLET M A, SCHOEMAN A S & DIPPENAAR-SCHOEMAN A S. (in press). The effect of Bt-cotton cultivation on spider (Arachnida: Araneae) populations in Marble Hall, South Africa. *African Plant Protection.*

MIDEGA, C.A.O., KHAN, Z.R., VAN DEN BERG, J., OGOL, C.K.P.O., DIPPENAAR-SCHOEMAN, A.S., PICKETT, J.A. & WADHAMS, L.J. (under review). Reponse of ground dwelling arthropods to a 'push-pull' system in Bt-maize: spiders (Araneae) as an indicator group.

MILLER, J.A. 2004. The genus *Brattia* beyond South America (Araneae, Linyphiidae). *Journal of Arachnology* 3(32): 526-538.

MODIBA, M.A., DIPPENAAR, S.M. & DIPPENAAR-SCHOEMAN, A.S. **2005**. A checklist of spiders from Sovenga Hill, an inselberg in the Savanna Biome, Limpopo Province, South Africa (Arachnida: Araneae). *Koedoe* 48(2): 109-115.

MOLISANI, G. 2005. Haltung und Zucht von *Parabuthus transvaalicus* Purcell, 1899. *Arachne* 10 (6): 4-10.

PEKÁR, S. & HADDAD, C. R. 2005. Can spiders (Araneae) avoid a surface with pesticide residues? *Pest Management Science* 61: 1179-1185.

PENNEY, D. 2004. New species records of *Peucetia* (Oxyopidae) from Uganda, with comments on the taxonomy of some African species. *Bulletin of the British Arachnological Society* 13: 93-94.

PENNEY, D. 2005. Two recent Arachnological meetings in South Africa. *Newsletter of the British Arachnological Society* 103: 6-7.

PICKFORD M. 2005. The Namib's amazing fossil spider webs. *Quest* 1(4): 30-32.

PRENDINI, L. 2004. On the scorpions of Gabon and neighbouring countries, with a reassessment of the synonyms attributed to *Babycurus buettneri* Karsch and a redescription of *Babycurus melanicus* Kovařík. *In*: Fisher, B.L. (Ed.) Monts Doudou, Gabon. A Floral and Faunal Inventory with Reference to Elevational Variation. *Memoirs of the California Academy of Sciences* 28: 235-267.

PRENDINI, L. 2005. Revision of *Karasbergia* Hewitt (Scorpiones: Buthidae), amonotypic genus endemic to southern Africa. *Journal of Afrotropical Zoology* 1: 77-93.

PRENDINI, L. 2005. Comment on "Identifying spiders through DNA barcodes". *Canadian Journal of Zoology* 83: 481-491.

PRENDINI, L. 2005. On *Hadogenes angolensis* Lourenço, 1999 syn. n. (Scorpiones, Liochelidae), with a redescription of *H. taeniurus* (Thorell, 1876). *Revue suisse de Zoologie* 112: 1-28.

NEW PUBLICATIONS ON AFRICAN ARACHNIDS (continued)

PRENDINI, L. 2005. Scorpion diversity and distribution in southern Africa: Pattern and process. Pp. 25-68. *In*: Huber, B.A., Sinclair, B.J. & Lampe, K.-H. (Eds.) African Biodiversity: Molecules, Organisms, Ecosystems. Proceedings of the 5th International Symposium on Tropical Biology, Museum Alexander Koenig, Bonn. Springer Verlag, New York.

PRENDINI, L., WEYGOLDT, P. & WHEELER, W.C. **2005.** Systematics of the *Damon variegatus* group of African whip spiders (Chelicerata: Amblypygi): Evidence from behaviour, morphology and DNA. *Organisms, Diversity and Evolution* 5: 203-236.

PRENDINI, L. & WHEELER, W.C. 2005. On the higher phylogeny and classification of Scorpiones according to Soleglad & Fet, with comments on standards for peer review in online publishing. *Cladistics* 446-494.

PRENDINI, L. (in press). New records and observations on the natural history of *Lisposoma elegans* and *Lisposoma josehermana* (Scorpiones: Bothriuridae). *American Museum Novitates.*

PRENDINI, L. (in press). New South African flat rock scorpions (Liochelidae: Hadogenes). *American Museum Novitates.*

ROFF, J & DIPPENAAR-SCHOEMAN, A. S. 2005. Description of a new species of bolas-spider from South Africa, with notes on its behaviour (Araneae, Araneidae). *African Invertebrates* 45: 1-6.

SAMADI, J.P. 2005. Lebensweise und Kokonbau von *Harpactira* cf*. guttata* im naturlichen habitat. *Arachne* 10(3): 6-12.

SILVA DÁVILA, D. 2005. Revision of the spider genus *Chrosioderma* Simon (Araneae: Sparassidae) *Proceedings of the California Academy of Sciences*, 4th Series, vol. 56, 24: 337—377.

SORENSEN, L.L. 2004. Composition and diversity of the spider fauna in the canopy of a montane forest in Tanzania. *Biodiversity and Conservation* 13: 437-452.

WARUI, C.M.; VILLET, M.H. &YOUNG, T.P. 2004. Spiders (Arachnida: Araneae) from black cotton soil habits of a highland savanna biome in Laikipia, central Kenya. *J. Afrotrop. Zool* 1: 13-24.

WENT, I & RAAB, T.2005. Die gattung *Pterinochilus* (Araneae: Theraphosidae: Harpactirinae), mit hauptaugenmark auf *Pterinochilus murinus* Pocock, 1897. *Arachne* 10(3): 13-23.

SAMADI, J.P. 2005. Lebensweise und Kokonbau von *Harpactira* cf*. guttata* im naturlichen habitat. *Arachne* 10(3): 6-12.

WARUI, C.M.; VILLET, M.H. &YOUNG, T.P. 2004. Spiders (Arachnida: Araneae) from black cotton soil habitats of a highland savanna biome in Laikipia, central Kenya. *Journal of Afrotropical Zoology* 1: 13-24.

WENT, I & RAAB, T.2005. Die gattung *Pterinochilus* (Araneae: Theraphosidae: Harpactirinae), mit hauptaugenmark auf *Pterinochilus murinus* Pocock, 1897. *Arachne* 10(3): 13-23.

WESOLOWSKA, W. 2004. A redescription of *Heliophanus pygmaeus* Wesolowska Russell-Smith, 2000, a small beetle-like salticid from Africa (Araneae: Salticidae) *Wroclaw* 15(2): 275-280.

WESOLOWSKA, W. 2005. A new species of *Enoplomischus* from Kenya (Araneae: Salticidae: Leptorchestinae). *Wroclaw* 16(2): 307-311.

WHITMORE, C., CROUCH, T.E., SLOTOW, R., & DIPPENAAR-SCHOEMAN, A.S. (in press). An evaluation of three surrogate measures of species richness that are used in rapid biodiversity assessment. *Conservation Biology.*

SOUTH AFRICAN NATIONAL SURVEY OF ARACHNIDA (SANSA)

NEWS FLASH:

SANBI—the South African National Biodiversity Institute recognizes SANSA and we are now in partnership with them. The first proposal for possible funding have been submitted and we'll know early next year.

The **SANSA Database** has been completed and we are in the process of entering all published data on the Arachnida of South Africa. With this baseline information we would be able to address various products as requested by end users. The main thrusts are: national catalogue for all the orders; species lists from : conserved areas, biomes, provinces, agro-ecosystems and urban areas**.**

Descriptive data with images for each species is being gathered in the **AFRAD (African Arachnida Database)** and will be available on-line early next year.

SANSA is a national atlassing programme dedicated to the unification and enhancement of research on arachnids in South Africa.

SANSA PROGRESS 2005

SPIDERS IN FLORAL BIOMES

GRASSLAND BIOME: The Grassland Biome is found on the high central plateau of South Africa, including large parts of Gauteng, Mpumalanga, Free State, parts of North West, the inland regions of KwaZulu-Natal and Eastern Cape. This biome is dominated by a single layer of grass and absence of trees, except in a few localized areas. There are many unique spiders found having adaptations in body form, colour and web and retreat construction. A total of **49 families represented by 209 genera and 400 species** have so far been recorded. From the plant layer 21 families, 101 genera and 188 species are known with the Araneidae, Thomisidae and Salticidae the more abundant families. From the ground layer 33 families, 108 genera and 312 are known with the Gnaphosidae, Lycosidae and Idiopidae the more abundant groups.Presently underway in Free State, Gauteng, KwaZulu-Natal. (ARC- Universities of Free State, Pretoria, KwaZulu-Natal; Gauteng NC).

SAVANNA BIOME: The Savanna Biome is the largest Biome in South Africa and occupies over one third of the whole area. It is characterized by a grassy ground layer and distinct upper layer of woody plants. Where the upper layer is short, it is known as shrubveld, where dense, as woodland and the intermediate stages are known as bushveld. The major delimiting factor is rainfall, which varies from 235 to 1000 mm per year and fire. More than 600 sites in the Savanna Biome have been sampled. This includes at least 11 sites (Dendron, Roodeplaat, Rustenburg, Nylsvley, Makelali, Kruger National Park, Springbok Flats, Marble Hall, Rust de Winter, Nelspruit, Lajuma) where long term surveys were undertaken for periods between one to five years. These surveys include data from conserved areas, farms and agro-ecosystems. At present a total of **53 families represented by 282 genera and 594 species** have been recorded from the Savanna Biome. Surveys continue (ARC- Universities of Free State, Venda, Pretoria, Limpopo).

FOREST BIOME: The Forest Biome covers less than 0.25% of the total land surface of South Africa. It can be subdivided into the coastal forest, the afromontane forest and sand forest. Forest tend to occur in patches and few patches cover areas > $1km^{2.}$ The only large forests occur in the Lowveld Escarpment and Garden route.More than 200 sites in the Forest Biome have been sampled. Several long-term surveys have been undertaken including data from coastal dune forest, sand forest and afromontane forest. At present a total of **47 families represented by about 312 species** have been recorded from the Forest Biome. The Forest Biome has the highest number of endemic of all the biomes. Surveys continue (ARC- Universities Pretoria, KZN, Free State, Western Cape NC).

OTHER BIOMES: Ad hoc collecting is undertaken in the nama-karoo and succulent karoo with a possible new project in the fynbos

SPIDERS IN AGRO-ECOSYSTEM

Surveys in agro-ecosystems continued. Surveys included: maize fields; Bt cotton; Pistachio; avocado and citrus orchards

SPIDERS IN CONSERVED AREAS

Surveys are continueing in several National Parks, reserves and other conserved areas. The aim of these surveys are to determine the number of species that are presently protected.

KWAZULU-NATAL

Surveys underway: Tembe Elephant Park; Ndumu Nature Reserve; St Lucia Wetland Park; Ngome State Forest; Phinda; Mkuze; Thando; Weenen.

EASTERN AND WESTERN CAPE

Surveys underway: Swartberg Nature Reserve ; Mountain Zebra National Park (Karoo National Park; Kammanassie Nature Reserve; De Hoop Nature Reserve**.**

LIMPOPO PROVINCE

Surveys underway: Western Soutpansberg; Kruger National Park (in part); Nylsvley Nature Reserve; Acacia Lodge.

NORTHERN CAPE

Surveys underway: Tswalu Nature Reserve, Richtersveld; Benfontein.

NORTH-WEST PROVINCE

Surveys underway: Pilanesberg Nature reserve; Rustenburg Nature Reserve.

GAUTENG

Surveys underway: Suikerbosrand Nature Reserve; Roodeplaatdam Nature Reserve.

PROVIINCES

All the surveys contribute towards species list for each province. The first check lists were compiled for six of the seven arachnid orders recorded from Gauteng: Amblypygi (1 sp.), Araneae (358 spp.), Opiliones (2 spp.), Pseudoscorpiones (10 spp.), Scorpiones (10 spp) and Solifugae (9 spp.). In total this represent 60 families, 223 genera and 390 spp.

PUBLIC PARTICIPATION

We received a wonderful response from the public and other researchers to help with the surveys. We provide the bottles and they help to collect, while other are busy to photograph our fauna: a special thanks to **Linda Wiese** (Jeffreysbay); **Allen and Jennifer Lotter** from Clocolan and **Michelle Bird** from Durban , **Daneel Fuchs** from Roedtan and **Rupert Harris** from the Soutpansberg.

8TH AFRICAN COLLOQUIUM –PAPERS

Biodiversity Edu-Ventures - simultaneously addressing education and specimen collection

BIRD, T.L. & MURAMBA, B.

In order to address the mandates of education and collecting of specimens, the National Museum of Namibia initiated a programme in 2003 called BIODIVERSITY EDU-VENTURES by which grade ten learners are taken on museum expeditions. During these expeditions, the children actively participate in collecting various organisms, e.g. invertebrates or reptiles. In this way hands-on education in biodiversity is combined with acquiring specimens from remote areas for Namibia's natural history collections. Funding and logistics are thus shared between seemingly different activities. This ensures that overall input is reduced whilst benefits are maximized. Areas to be visited are selected for their remoteness, their biodiversity potential and the number of specimens from that area in the natural history collections. So far, five Edu-Ventures expeditions have been successfully completed. Throughout, an emphasis is put on the values of biodiversity, the threats it is facing, the way it is distributed and the difficulties in conserving and monitoring it. Various techniques are utilized by which to achieve the main goals of the programme.

Diversity of spiders (Araneae) in a one-hectare suburban study-site in Harare, Zimbabwe: preliminary results

CUMMING, M.S., RUSSELL-SMITH, A., WESOLOWSKA, W & DIPPENAAR-SCHOEMAN, A.S.

This study reports on the diversity of spiders collected in a one-hectare suburban study-site 4km from Harare city-centre. A few specimens were collected in 1991-1992 and the bulk over a six-year period from 1999-2004. The site consists of a 0.6 ha contained garden with a house and two outbuildings, and an adjoining undeveloped and uncultivated 0.4 ha plot. The garden was established in the 1940s in what was miombo woodland; several large indigenous trees remain and about 40% is covered with indigenous grass swards. The site has been organically managed with no application of artificial chemicals for 28 years and forms part of the typical low-density, middle/higher-income, leafy suburb of Highlands. Hand-collection was the main capture method, with periodic use of pitfall traps and sweep-netting. To date, more than 270 species from 39 families have been caught; the number of genera has yet to be finalised. Salticidae (16%), Theridiidae (15%), Thomisidae (11%), Araneidae (11%), Gnaphosidae (7%) and Oxyopidae (7%) are the most species-rich families. The diversity is as high as that recorded in surveys of much larger areas with several habitat types, mostly in nature reserves, in South Africa. The key, unanswered, question is whether the observed high spider diversity is promoted by the wide variety of microhabitats found in suburbia, or whether it is a result of long-term year-round collecting by a resident. It is concluded that at least certain types of suburbia carry a very high spider diversity but whether this diversity is higher or lower than in non-urbanised surrounding areas has not been investigated.

Spider diversity in conserved areas in South Africa (Arachnida: Araneae)

DIPPENAAR-SCHOEMAN, A.S. & HADDAD, C.R.

Conservation biologists are starting to recognize the importance of the invertebrate component in the functioning of healthy ecosystems Therefore, any approach to conservation needs to take into account the composition of the invertebrate fauna. As part of the South African National Survey of Arachnida (SANSA), projects are underway to determine the biodiversity of arachnids present in conserved areas in South Africa. Although spiders constitute an abundant and highly diverse group of invertebrate animals little is still known about their diversity in most conserved areas. Inventories with resulting checklists provide valuable baseline information on species and are the first step for a better understanding of the fauna present. The aim of these inventories is to determine the percentage of species presently protected in South Africa.

Spiders for Africa - the African Arachnida Database (AFRAD): an online expert information system

DIPPENAAR-SCHOEMAN, A.S. & JOCQUÉ, R.

The ARC-Plant Protection Research Institute and the Koninklijk Museum voor Midden-Afrika, Belgium launched the African Arachnida Database (AFRAD) in 1995, in accordance with the Convention on Biological Diversity. AFRAD is an umbrella project dedicated to the unification and enhancement of biosystematic research on Arachnida in Africa. The main aim of AFRAD is to make an inventory of the Arachnida fauna of Africa that will provide essential baseline information needed to address issues such as conservation and sustainable use. For the spiders the first priority identified was the need for practical illustrated keys to families, subfamilies, genera and species. The first phase, keys to families and subfamilies was completed in 1997 and the second phase, keys to genera and species are underway. It was decided by the African Arachnologists to incorporate all existing data into an on-line expert information system. This system contains the following: descriptions, keys, drawings and photo galleries, on all the African spiders; information on diversity in the form of checklists and maps for each country and information on collections and on research projects in progress. The AFRAD expert system is available on-line on the ARC web site (). AFRAD has provided a remarkable stimulus to arachnid research in Africa since the launch of the project and several projects have been completed or are in progress. The identification tools will make an important contribution to bypass the present taxonomic impediment.

Spider diversity of the Forest Biome in South Africa (Arachnida: Araneae)

DIPPENAAR-SCHOEMAN, A.S., SWAYNE, J. , WASSENAAR, T. & HADDAD, C.R.

The Forest Biome covers less than 0.25% of the total land surface of South Africa. It can be subdivided into the coastal forest, the afromontane forest and sand forest. The Forest Biome is restricted to frost free areas with an annual rainfall of more than 525 mm in winter and 725 mm in summer. Forests tend to occur in patches, and few patches cover areas > 1km2. The only large forests occur in the Lowveld Escarpment and Garden route. This study reports on the diversity of the spiders of the Forest Biome. The first species list was compiled from existing literature, as well as surveys. More than 200 sites in the Forest Biome have been sampled. Several long-term surveys have been undertaken including data from coastal dune forest, sand forest and afromontane forest. At present a total of 47 families represented by about 312 species have been recorded from the Forest Biome. The Forest Biome has the highest number of endemics of all the biomes. This study forms part of the South African National Survey of Arachnida. Threatened, rare, representative and flagship species are indicated.

Spider diversity of the Savanna Biome in South Africa (Arachnida: Araneae)

DIPPENAAR-SCHOEMAN, A.S., VAN DEN BERG, A. & FOORD, S.

The Savanna Biome is the largest Biome in South Africa and occupies over one third of the whole area of the country. It is characterized by a grassy ground layer and distinct upper layer of woody plants. Where the upper layer is short, it is known as shrubveld, where dense, as woodland and the intermediate stages are known as bushveld. The major delimiting factor is rainfall, which varies from 235 to 1000 mm per year, and fire. This study reports on the diversity of the spiders of the Savanna Biome. The first species list was compiled from existing literature, as well as surveys. More than 600 sites in the Savanna Biome have been sampled. This includes at least 11 sites (Dendron, Roodeplaat, Rustenburg, Nylsvley, Makelali, Kruger National Park, Springbok Flats, Marble Hall, Rust de Winter, Nelspruit, Lajuma) where long term surveys were undertaken for periods between one

to five years. These surveys include data from conserved areas, farms and agro-ecosystems. At present a total of 53 families represented by 282 genera and 594 species have been recorded from the Savanna Biome. This study forms part of the South African National Survey of Arachnida.

Morphometrics and population structure in the burrowing scorpion *Opistophthalmus pictus* Kraepelin, 1894 (Scorpiones: Scorpionidae)
ENGELBRECHT, I. & BYRNE, M.

This study on a population of the burrowing scorpion *Opistophthalmus pictus* set out to test methods for determining the number of instars in a scorpion life cycle. The lengths of different body structures were used in morphometric plots to determine if discrete groups could be distinguished. These data were then used to quantify the age structure of the population, to infer demographic processes that might be occurring. Five discrete age groups were recognized, indicating that this species has a total of six instars in its lifecycle (the initial instar spent on the mothers back is not included in the study). The population structure indicated consecutively fewer individuals from the adult to the second instar, possibly due to sampling bias, variable recruitment success annually or a density-dependant decrease in recruitment rate.

Habitat distribution modeling and conservation of three arachnid species in Gauteng Province, South Africa
ENGELBRECHT, I. & ERASMUS, B.

Biodiversity conservation planning tries to optimize the relationship between the numbers of species protected and the area of land set aside for conservation. The Gauteng Department of Nature Conservation is currently undertaking a biodiversity conservation planning process within the province, and a wide variety of animal and plant species are included in this. In order to determine the optimal configuration of protected areas, it is important to have a fair indication of where the species might occur. This information may be acquired through extensive surveys, or a number of habitat distribution modeling methods may be employed which utilize currently available data. The purpose of this project is to develop such habitat distribution models for three arachnid species currently listed as threatened within the province. GARP (Genetic
Algorithm for Rule Set Production) is the modeling methodology employed. The model generates a set of rules for predicting species presence or absence in a particular area based on the set of environmental predictor variables in that area. 100 GARP models will be developed for each species and the proportion of predictions per cell mapped as the probability of occurrence across the province. Models will be developed

using data collected in a field survey of 47 sites over a regular grid in the province, and tested using independent data from museum records. It is expected that the use of modeled species distributions will have important implications for the conservation planning process when compared to the use of locality data per species only, as well as implications for the conservation status of these species.

The Gauteng Biodiversity GAP Analysis Project: Arachnid Conservation
FORSYTH, M. L.

Gauteng Nature Conservation of the Gauteng Department of Agriculture, Conservation and Environment (GDACE) initiated the Biodiversity GAP analysis project (BGAP Project) in June 2001. This project was initiated in response to the need for the identification and mapping of priority areas in the province where development, habitat transformation and fragmentation should be discouraged, and conservation efforts should be focused. The BGAP project objective is to produce a GIS-based biodiversity database compiled by overlaying spatial information on each of the major groups of fauna and flora and other important biodiversity components. Methods involve collation of all existing information from museums and herbaria, networking with external experts, literature surveys to establish appropriate methods, field surveying, field monitoring of biodiversity, data analysis and interpretation. The identification and mapping of priority areas is achieved through a conservation planning exercise within the Arcview-linked C-Plan software, based on the systematic conservation planning protocol developed by Margules & Pressey (2000). The results of the project will, amongst other things, assist in: 1) the identification of biodiversity hotspots in Gauteng for the establishment of conservancies, new provincial nature reserves and / or the registering of natural heritage sites; 2) the identification of biodiversity hotspots in Gauteng where Strategic Environmental Assessments are required as future land use planning contradicts environmental sensitivities of these areas; 3) compilation of biodiversity inventories for development hotspots and conservation areas in the province; 4) incorporation of data into the land-use planning process at local government level; 5) development of provincial policy and law, and; 6) identification of gaps requiring further conservation research in the province by external academic institutions. Within the BGAP Project, arachnids have been identified as a priority group for conservation efforts and they have been included in the conservation planning exercise to date.

Towards a phylogeny for the family Hersiliidae (Arachnida: Araneae)
FOORD, S.H. & DIPPENAAR-SCHOEMAN, A.S.

A series of contemporary revisions of Australian, Oriental and Neotropical hersiliids resulted in the description of several new species and six new genera. As a result of these studies, questions were raised about the continent of origin of the family, the large degree of character variation in the largest genus, *Hersilia*, of the family, and the identity of the ground-living '*Tama*' species found in the arid regions of Southern Africa. These questions mostly revolved around Africa. However, the Afrotropical Region remained the only region for which a recent revision did not exist. We report on the results of such a study, answer some of the questions and attempt to solve the remainder by proposing a phylogeny for the hersiliids of the world.

The biogeography of ant-like and dark sac spiders (Araneae: Corinnidae) in South Africa and Lesotho
Haddad, C.R.

The spider family Corinnidae is a moderately diverse family and is well represented in South Africa and Lesotho. However, this number is likely to double as there are many new species which have to be described. During the past five years I collected corinnids at nine sites in contrasting biomes in South Africa and Lesotho. A list of the species collected at each site is presented. The highest diversity of all the sites was found in northern KwaZulu-Natal, with 23 species. Comparisons were made of the species composition of these sites using Sörensen's Quotient of Similarity (Magurran, 1988), and related to biome type and distance between sites. The three pairs of sites most closely situated to one another had the most similar faunas: Ndumo Game Reserve and Tembe Elephant Park in Maputaland (0.722); the Mohale Dam catchment and the southern Maluti Mountains in Lesotho (0.706), and; the De Hoop Nature Reserve and town of Fisherhaven in the south-western Cape Province (0.667). These site pairs were less that 100km from each other, and were situated in the same biomes, i.e. savanna, montane grassland and fynbos, respectively. Linear regression suggests a stronger correlation between distance between sites and faunal similarity at low distances <500km ($R2 = 0.7641$) than at distances >500km ($R2 = 0.4008$). Low similarity values between compared sites reflect a higher level of endemicity, particularly for the fauna of Maputaland (18 species, 78.3% endemic), the south-western Cape (6 species, 60.0% endemic) and the Eastern Cape (4 species, 50.0% endemic). The majority of species on the coastal plains of South Africa show restricted distributions, which indicates a more specialised and endemic fauna, irrespective of biome type. The fauna of the semi-arid grassland and Nama-Karoo biomes appears more closely related to each other, indicating a broader distribution of species in the central and north-western half of South Africa. The fauna from montane grassland in the Maluti Mountains

shares elements with that of the Free State, but is geographically isolated from the Maputaland and Eastern Cape faunas.

A revision of the genus *Cambalida* Simon, 1909 (Araneae: Corinnidae) in central and southern Africa: distribution, ecology and description of two new species

HADDAD, C.R.

The genus *Cambalida* Simon, 1909 (Araneae: Corinnidae) is recorded for the first time in central and southern Africa. All species previously described were only known from West Africa. A diagnosis of the genus is provided. *Cambalida coriacea* Simon, 1909 is recorded widely in the region, making it the most broadly distributed species in the genus. *Castianeira fulvipes* Simon, 1896, *C. depygata* Strand, 1915 and *C. mestrali* Lessert, 1921 are newly synonymised with *C. coriacea*. Two new species are described, *C. exilis* from the Democratic Republic of Congo and Angola (female and male), and *C. singularis* from Zambia (male only). Notes on the biology of *C. coriacea* are provided.

The Arachnida of Lesotho – an AFRAD project

HADDAD, C.R.& DIPPENAAR-SCHOEMAN, A.S.

As part of the African Arachnid Database (AFRAD) projects, checklists of the arachnid faunas of various countries are being prepared. The present study deals with progress made in recent years to determine the diversity of Arachnida of the mountain kingdom of Lesotho. Lesotho is one of the smallest countries in Africa, with a surface area of approximately 30 300 square kilometres, and is landlocked along all its borders with South Africa. About one quarter in the west is lowland country, varying in height from 1500 to 1600 m a.s.l., while the remaining three quarters form the highlands, ranging between 2000 and 3400 m a.s.l. Until now, very little was known of the arachnid diversity, except for sparse records in taxonomic papers. Two intensive surveys were conducted recently, to determine the arachnid fauna associated with islands and the catchment area of the Mohale Dam (MD) in central Lesotho (March and December 2003), and of mountains in southern Lesotho for the project "Conserving Mountain Biodiversity in Southern Lesotho" (CMBSL, November 2003). Sampling was carried out primarily by rock turning and sweep-netting, with beats and leaf litter searching, where possible. A total of 240 species of spiders (40 families) are now known from Lesotho, including 109 spp. from 31 families from MD, 152 spp. from 34 families (CMBSL), and 100 spp. from 34 families (ARC – PPRI database). Opiliones are represented by 7 species in two families, Pseudoscorpiones by 5 species (1 family) and Scorpiones by a single species, *Opistacanthus validus* (Scorpionidae). It is likely that a large number of additional records will be known following completion of the biodiversity surveys that form part of the Maluti-Drakensberg Transfrontier Park project. Additional unsorted material from western Lesotho collected by staff of the National University of Lesotho will also add to the knowledge of the arachnid diversity of the country.

Spider diversity in conserved areas in the Western Cape Province

HADDAD, C.R. & DIPPENAAR-SCHOEMAN, A.S.

Compared to many other South African Provinces, the Western Cape Province has been relatively well studied with regards to arachnid diversity. Much material used in early taxonomic works was collected in the Western Cape, particularly in the areas around Cape Town. Several early revisions (e.g. Tucker, 1923) were largely based on material collected within this province. An extensive collection housed in the South African Museum, Cape Town, is s rich source of material for taxonomic studies. Despite the rich material for taxonomic studies, relatively few ecological studies have been conducted here. As part of the South African Survey of Arachnida (SANSA), surveys have been conducted and are underway in four protected areas in the province, namely the Karoo National Park (KNP), Swartberg Nature Reserve (SBNR), and De Hoop Nature Reserve (DHNR). Presently, 38 families, 102 genera and 116 species of spiders (Araneae) are known from the KNP. A checklist of the spiders of the SBNR is in press, and lists 187 species in 136 genera and 45 families, including a new family record for South Africa, the Filistatidae. Only a single two-week survey has been conducted in the DHNR, and additional surveys are planned for 2005-2007. So far, 161 species of spiders (135 genera and 44 families), 6 species of Scorpiones (4 genera, 3 families), 4 species of Opiliones (4 genera, 3 families), 3 species of Pseudoscorpiones (3 genera, 2 families), and 1 species of Solifugae have been collected. With its unique fynbos and extensive karoo habitats, the Western Province protected areas should be more thoroughly surveyed to determine biodiversity and levels of endemism.

A checklist and ecological notes of the spiders (Arachnida: Araneae) of the Ndumo Game Reserve

HADDAD, C.R., DIPPENAAR-SCHOEMAN, A.S. & WESOŸOWSKA, W.

After five years and six research trips to intensively sample invertebrates in the Ndumo Game Reserve in northern KwaZulu-Natal (Maputaland), a checklist of the spiders (Arachnida: Araneae) of the reserve in presented. More than 350 species of spiders from 41 families have been collected, which represents the highest diversity of this taxon known from any protected area in South Africa. The most diverse families include the Salticidae (80 spp.), Thomisidae (38 spp.), Araneidae (31 spp.), Gnaphosidae (24 spp.), Oxyopidae (24 spp.), Corinnidae (22 spp.) and Theridiidae (20 spp.). The continued discovery of additional new records for the reserve with each additional trip undertaken supports the possibility that many more species still await discovery in the reserve, particularly in poorly sampled habitats (e.g. broadleaf woodland, sand forest and *Acacia tortilis* grassland). Taxonomic and ecological notes on the diversity and ecology of Salticidae, Thomisidae and Corinnidae from Ndumo, are provided.

An assessment of the biological control potential of *Heliophanus pistaciae* (Araneae: Salticidae) on *Nysius natalensis* (Hemiptera: Lygaeidae), a pest of pistachio nuts

HADDAD, C.R., LOUW, S. VDM & DIPPENAAR-SCHOEMAN, A.S.

The predation potential of *Heliophanus pistaciae* Wesoÿowska (Araneae: Salticidae) on one of the minor pests of pistachio nuts, *Nysius natalensis* Evans (Hemiptera: Lygaeidae), and vinegar flies, *Drosophila melanogaster* Meigen (Diptera: Drosophilidae), was assessed in laboratory and field trials. Laboratory tests were conducted using Petri dishes, and field trials using cotton mesh bags placed over pistachio nuts clusters. In feeding tests, female and male *H. pistaciae* consumed significantly more *D. melanogaster* than *N. natalensis* in the first and second days of the experiments. Consumption of *N. natalensis* by both sexes increased significantly during the second day of the experiments. The increase in feeding by females on *D. melanogaster* was not significant during day 2, while decreased feeding by males was also not significant. Prey preference tests found female *H. pistaciae* to prefer *D. melanogaster* (91%) to *N. natalensis* (9%). Different capture rates may be related to prey size and/or palatability. Field trials found female *H. pistaciae* (n=20) to kill a mean of 1.05 *N. natalensis* in a 24-hour period. The experiments indicate that *H. pistaciae* may have a limited role as a biological control agent of *N. natalensis*, but a combination of predation and effective orchard management should be able to suppress *N. natalensis* populations below damaging levels in pistachio canopies.

Diversity of spiders (Araneae) in the indigenous forests of Limpopo Province, South Africa

HORN, J.L., HAMER, M.L., DIPPENAAR-SCHOEMAN, A.S. & SLOTOW, R.

The spider fauna of the Limpopo Province forests in South Africa is poorly known. Unless more data are made available, spiders will be excluded from conservation and management planning for forests of the region. A survey was conducted to determine the spider species composition of Limpopo Province forests and to identify patterns in spider diversity and distribution. Web building and ground wandering spiders were sampled over a one-year period in 11 forests, including six from the east-central Soutpansberg and five

from the Northern Drakensberg, using pitfall traps and active searching of transects. The sampled forests comprise two distinct forest subtypes, Moist Evergreen and Semi-deciduous Forest. A total of 704 individuals from 25 families, 53 genera and 65 species were recorded and a check list is given. Endemic and potentially new species were sampled and most of the species are new records for the area. Results indicate that sampling was incomplete and more techniques should be used to target additional guilds; this study should be considered accordingly. Although there was no significant difference between individual forests for spider richness and diversity, Semi-deciduous Forest was significantly more diverse, but not richer, than Moist Evergreen. The Soutpansberg was significantly richer and more diverse than the Northern Drakensberg, but regional differences were not statistically significant when only Moist Evergreen Forests were considered. Both forest subtype and location were important influences on spider species composition; similarities were strongest between forests in the same mountain region and those sharing the Moist Evergreen Forest subtype. However, similarity was not influenced significantly by the distance between individual forests. No two forests contained the same species assemblage and the majority of species were unique to a single forest subtype or mountain region. Although additional inventory work is needed, this study provides insight into some patterns of spider diversity and distribution in Limpopo Province forests and presents a foundation for further research and the enhancement of conservation planning.

Pseudocorinna (Araneae, Corinnidae): another somatic spider template with a large range of complexity in the genitalia

JOCQUÉ, R. & BOSSELAERS, J.

Pseudocorinna Simon, 1910 is a small genus of which very little is known. Of the type species, *P. rutila* from Guinea Bissau, both sexes are known; both the other species from Bioko have only been described from females. The genus has the typical characters of Corinninae and is further characterized by a network of small granulations on the cephalothorax and other hard parts of the prosoma, and double rows of spines extending from metatarsi to femora on the anterior leg pairs. The granulations appear to be the outlets of glands of which the function is unknown. Revision of the genus resulted in the recognition of 23 new species distributed in the entire western and central African forest blocks as far east as the Kivu in DR Congo. The genus has not been recorded from the eastern and southern African forests. Representatives of the genus are clearly linked with very wet, often inundated forests. Whereas the somatic characters of the genus are very stable, the genitalia exhibit a large range of complexity which is apparently the result of radiations along two trajectories. In the most ancestral palpal conformation, the tegulum has a longitudinal swelling with short excrescences in front and on the pro- and retrolateral sides, a fairly short embolus with a conductor of similar length and a short distally inserted median apophysis. In the more derived clades the tegular swelling is restricted to the posterior part of the bulbus with all the excrescences in front. In one clade the embolus tends to increase in length sometimes accompanied with a longer median apophysis and conductor. In another clade only the latter sclerites become longer whereas the embolus is reduced to a small spiniform prong. In these species the epigyne has a large bowel-shaped bladder which is supposed to accommodate the large conductor during copulation. This is the first well documented case in which the increase in complexity of the genitalia involves the shortening of the embolus.

Spiders of Marion Island

KHOZA, T.., DIPPENAAR, S.M. & DIPPENAAR-SCHOEMAN, A.S.

The last survey of spiders on Marion Island was done in 1971 during which specimens belonging to two families (Linyphiidae and Desidae) were collected. Since it is possible for spiders to arrive unknowingly another survey was done. Spiders were collected over a period of four weeks (11 April – 30 May 2004). The aim of the study was to determine the latest spider diversity on Marion Island and to compile morphological descriptions of the collected spiders. Three different collection methods (active search, Tullgren funnels and pitfall traps) were used to catch spiders from six different vegetation types and each of the three methods was applied in each vegetation type. Collected specimens were preserved in 70% EtOH, studied using both stereo- and light microscopes and drawn with the aid of drawing tubes. Selected specimens were dissected and studied using the wooden slide technique while others were prepared for scanning electron microscopy using standard methods. A total of 687 individuals from three families (Linyphiidae, Desidae and Salticidae) were collected during the study period. These include *Prinerigone vagans* (Audouin, 1826) of the Linyphiidae, *Myro kerguelenesis* O.P.-Cambridge, 1876, *M. paucispinosus* Berland, 1947 of the Desidae, and an unknown specimen of the Salticidae.

Biodiversity and macroecology of huntsman spiders (Arachnida: Araneae: Sparassidae) in southwestern Africa

KUNZ, D.

The family Sparassidae is distributed throughout tropical and subtropical zones worldwide, with over 80 genera and about 1000 described species. The African Sparassidae, with about 200 described species and 35 genera, are This study formed part of an effort to determine the biogeographical status of these inter-Namib-Kalahari dunes. For the fieldwork component, 22 isolated dune patch localities in south-central Namibia were sampled, and 3 sites in the western periphery of the main Kalahari. Mainly nocturnal hunters, occurring in various habitats (savanna, desert, Karoo, Fynbos, tropical rainforest, etc.). The Sparassidae are distinguished by their large variability of body size (small = 5 mm to large = 40 mm) from other spider families with similar hunting tactics (Lycosidae: 3 to 30 mm, Pisauridae: 8 to 30 mm). Thus, they are perfectly suitable for questions of evolution of body size and habitat adaptations by their variety of body size and their distributional patterns in southern Africa. As a first part of the present study, taxonomic and ecological results of the material of the institutions and museums in South Africa, with the major focus on the Fynbos and succulent Karoo biomes, are shown.

The Scorpiones (Arachnida) of the Free State Province, South Africa

LOTZ, L.N.

The Free State Province is one of the South African Provinces that have been poorly surveyed for invertebrates in the past. As part of the South African National Survey of Arachnida, a first annotated check list of the Scorpiones of the Free State Province is presented here. The scorpion families Ischnuridae, Scorpionidae and Buthidae were recorded, represented by seven genera and 18 species. Seven species are newly recorded for the Province. The distribution and habitat of the species is discussed and areas for further study are highlighted.

SANSA surveys of the Free State Province, South Africa

LOTZ, L.N.

SANSA surveys of the Free State Province, South Africa, were started a few years ago with a preliminary survey of the Opiliones species. Since then a preliminary survey of the Scorpiones was also undertaken and the results of this is presented elsewhere during this Colloquium. A long-term survey of the Araneae of the province has just been started. Other surveys are also planed for the Solifugae and Pseudoscorpiones. Amblypygi have not yet been found in this Province. The spider survey will also try to involve the general public in the collecting process.

The Genus *Latrodectus* (Araneae: Theridiidae) in the Afrotropical Region

LOTZ, L.N. & VANUYTVEN, H.

The distribution of the representatives of the genus *Latrodectus* from the Afrotropical region is reviewed. New data gathered gives a better idea of the distribution of the genus. Descriptive information is given for the 10 species: *L. cinctus* Blackwall, 1865, *L. geometricus* C.L. Koch, 1841, *L. hystrix* Simon, 1890, *L. industinctus* O.P. Cambridge, 1905, *L. karrooensis* Smithers, 1944, *L. menavodi* (Vinson, 1863), *L. pallidus* O.P.

Cambridge, 1872, *L. renivulvatus* Dahl, 1902, *L. rhodesiensis* Mackay, 1972 and *L. tredecimguttatus* (Rossi, 1790). The position of the species *L. schuchii* C.L. Koch, 1837 is also looked at.

The spider diversity on Sovenga Hill
MODIBA, M.A., DIPPENAAR, S.M. & DIPPENAAR-SCHOEMAN, A.S.

The aim of SANSA (South African National Survey of Arachnida) is to make biodiversity assessments of the arachnid fauna of South Africa. Amongst others, projects were initiated to determine the spider biodiversity in the Savanna Biome of South Africa and attempts are underway to compile a checklist for the spiders of the Limpopo Province. A survey of the spider biodiversity was done on Sovenga Hill on the campus of the University of the North. This was the first survey for the area and will also form part of SANSA. The study took place during April and May 2004 on Sovenga Hill with the aim to gather information on biodiversity and species richness of the spider community. Six sites were selected on each of the southern, eastern, northern and western slopes. Sampling was conducted twice a week during the morning. Spiders were caught using five different methods, namely tree beating, sweep netting, active searching, pitfall traps and sieving leaf litter. Caught spiders belong to 29 families. The highest number of spiders caught during April belongs to Salticidae (44), followed by Lycosidae (40), Clubionidae (39) and Thomisidae (35), while the lowest number caught belongs to Amaurobiidae (1), Hersiliidae (1) and Palpimanidae (1). During May the highest numbers belonged to Thomisidae (38), followed by Lycosidae (37) and Gnaphosidae (27), with the lowest belonging to Agelenidae, Caponiidae, Hahniidae, Linyphiidae and Segestriidae, each with only a single specimen caught.

Molecular phylogeny and re-appraisal of the conservation status of *L. speluncarum* in the Pretoria area
MYBURGH, J.G., DIPPENAAR-SCHOEMAN, A.S., NELSON, R.M. & GREEFF, J.

Caves are islands within a sea of land, and cave dwellers are most often very well adapted to their isolated underground ecosystems. Very little biospeleological research is done in South Africa. Southern Africa (South Africa, Namibia, Botswana and Mozambique), with its large number of caves, has been described as an "Eldorado" for a biospeleologist. Gerry Newlands collected *Loxosceles speluncarum* spiders from 3 caves in the Pretoria area more than 25 years ago, namely the Fountains cave, the Monumentpark cave and the Wonderboom cave. Recently all three caves were re-visited to collect *L. speluncarum* spiders to get some impression of gene flow between these caves. *Loxosceles speluncarum* spiders were found (and collected) in the Wonderboom and Fountains caves, but none in the Monumentpark cave. The *L. speluncarum* population in the Fountains cave seems to be healthy and thriving. However, the Wonderboom cave situation is slowly deteriorating due to human involvement. Cave spider ecology and conservation, with special reference to *L. speluncarum* in the Pretoria area, will be discussed and illustrated. Preliminary molecular work based on 700 bp (3'end of 16S rRNA to mid NADH dehydrogenase) showed 5 alleles in 12 spiders. There were no shared alleles between the caves and the phylogenies suggest that the Fountains cave was populated from the Wonderboom cave, but that very limited gene flow takes place.

The arachnid fauna of isolated dune patches in central- and southern Namibia
POLLER, R.G. & HADDAD, C.R.

Due to a range of highly divergent habitats, the arachnid fauna in Namibia is varied and highly specialized, in most cases. It is estimated that the collected and described spider specimens only represent 10 percent of the actual number of species that occur in the country (Griffin & Dippenaar-Schoeman, 1991). A checklist of Araneae was compiled by these authors in 1991, which includes 50 families, 238 genera and 578 species known to occur, or expected to occur in Namibia. During a palaeoenvironmental study, arthropods were collected on isolated dune patches occurring in central and southern Namibia. The first survey was conducted at the end of March 2003, which roughly marks the end of the rainy season for the region. Re-sampling of three sites and sampling of an additional Kalahari site commenced at the beginning of April 2004. A standard protocol of method was employed across all 26 localities and involved preservative pitfall trapping and preservative yellow pan trapping set up for 72-hour regimes. A total of 370 arachnids were collected, representing 23 families and 56 species. The most abundant families were Gnaphosidae, which accounted for 51.85% of the total collected specimens, followed by the Salticidae (18.86%), Ammoxenidae (3.87%) and Daesiidae (3.31%). The most abundant species were *Asemesthes lineatus* Purcell 1908 (Gnaphosidae, 24.92%), *Setaphis bilinearis* Tucker 1923 (Gnaphosidae, 14.14%), *Menemeres* sp. (Salticidae, 11.45%) and *Zelotes o'neili* (Purcell, 1907) (Gnaphosidae, 8.42%). Pitfall trapping (n=278, 46 spp.) was a much more effective sampling technique than yellow pan traps (n=92, 31 spp.). The results indicate a similar pattern of community composition compared with other studies conducted in arid and semi-arid parts of Namibia and South Africa. This study revealed several species new to science.

Karyology of Pseudoscorpiones
ŠTÁHLAVSKÝ, F., KRÁL, J., HENDERICKX, H. & HARVEY, M.S.

The Pseudoscorpiones is the fourth largest arachnid order with more than 3200 described species. In spite of this diversity, the karyotypes of pseudoscorpions are largely unknown. Until the end of the last century, the karyotypes of only nine species from three families had been described. During last four years, we have obtained results in a further fifty species belonging to ten families, namely Atemnidae, Cheiridiidae, Cheliferidae, Chernetidae, Chthoniidae, Garypidae, Geogarypidae, Larcidae, Olpiidae, and Neobisiidae. The results suggests that pseudoscorpion karyotypes consist of monocentric chromosomes; biarmed chromosomes predominate in the majority of species. The probable ancestral karyotype consists of a higher diploid chromosome number, around 50-60; the original sex chromosome system is probably the X0 system. This type of karyotype is the most frequent in many families. We suppose that the karyotype of some other studied groups evolved from ancestral karyotype pattern. Our results allow us to hypothesise that the evolution of many groups has been accompanied by a reduction of the chromosome numbers. It is easy to observe this trend in the genus *Chthonius* (Chthoniidae). Reduction of chromosome numbers was characterised by tandem and centric fusions as well as the gradual conversion of acrocentric chromosomes to biarmed ones, mostly by pericentric inversions. A tendency towards reduced chromosome numbers is also obvious in the family Neobisiidae. Reduction in the genus *Neobisium* took place via multiple fusions that led to conspicuous "macrochromosomes". Substantial variability was also found in sex chromosomes systems. We found X0, XY, and also various neo-sex chromosomes systems in this group. Extreme reduction of 2n was found in the families Olpiidae. The lowest chromosome number found within the family Olpiidae is only 2n=7. This number is the lowest found of all Pseudoscorpiones. Despite the great reduction of the chromosome number the sex chromosome system X0 is preserved in all observed olpiids. In contrast to other groups, an increase of the chromosome number seems to be characteristic of the family Atemnidae. In studied species the diploid number reaches up to 137 in *Oratemnus* sp. The great diversity in karyotypes of pseudoscorpions appears to be useful for cytotaxonomic studies and detection of cryptic species, as for example in the ongoing analysis of the *Neobisium-carcinoides* complex. Therefore, it is obvious that karyological data on pseudoscorpions can resolve taxonomic problems in this morphologically very uniform group and moreover to construct hypotheses about the relationships of species and evolution of groups.

Recent advances in palaeoarachnology and the true identity of the supposed giant fossil spider *Megarachne*
PENNEY, D. & SELDEN, P.A.

The current state of knowledge of the spider fossil record is presented in the form of an evolutionary tree, by superimposing the accepted cladogram of spider phylogeny over geological time and calibrating it with fossil data. The importance of this technique is that it allows minimum-age predictions to be made for

taxa with an incomplete, or non-existent fossil record. It also highlights graphically, biases associated with the spider fossil record in terms of rich and poor sources of fossil spiders and different modes of preservation. Combining neontological and palaeontological data in this manner provides an immense amount of information and thus the ability to investigate palaeobiological problems that could not be addressed adequately using solely palaeontological data. In this presentation recent and ongoing advances in fossil spider taxonomy and palaeobiology are illustrated. The fossil record of spiders is extremely useful for addressing palaeobiological problems but it is still far from complete. *Megarachne servinei* HŸnicken, 1980, from the Permo-Carboniferous Bajo de Vÿliz Formation of San Luis Province, Argentina, was described as a giant mygalomorph spider which, with a body length of 339 mm, would be the largest spider ever to have lived on Earth. The interpretation was based on: the carapace shape, position of the eye tubercle, interpretation of the carapace anterior protrusion with median ridge as a pair of chelicerae, and a posterior, circular structure as the abdomen. Morphology hidden in the matrix was suggested by x-radiography: cheliceral fangs, sternum, labium and coxae; and so a reconstruction of *Megarachne* as a giant spider was presented. Difficulties with the interpretation (unusual cuticular ornament, suture dividing the carapace, and spade-like anterior border of the chelicera), together with non-preservation of synapomorphies of Araneae, provoked debate about its interpretation as a spider. Now, the holotype and a new specimen have become available for study. *Megarachne* is not a giant fossil spider; its true identity will be revealed!

Predatory strategies of *Dysdera* species, the woodlice specialists
ŸEZÁŸ, M. & PEKÁR, S.

I the genus *Dysdera* are known to feed regularly on woodlice. Their specialisation was put into question recently as *Dysdera crocata* did not prefer woodlice to other arthropods in the laboratory. In this study we present evidence that some *Dysdera* species are adapted morphologically to feed on woodlice. Species of this genus are characterised by an unusual variability in the shape of their chelicerae. Three basic types are distinguished: long chelicerae (with normal fangs), short chelicerae (with normal fangs), and short chelicerae with flat fangs. We expect that selection favoured the evolution of chelicerae that are most efficient in capturing particular prey. To observe how the chelicerae are used in prey capture, we used three *Dysdera* species, each representing one type of chelicerae, and *Armadilidium vulgare* as a prey. This species of woodlice was the most abundant in the habitats of the *Dysdera* species studied. All three species readily captured woodlice but showed different capture strategies. *D. hungarica* (long chelicerae) used fangs to puncture woodlice from the dorso-ventral sides. The attack was immediate so that the woodlouse could not roll itself up. *D. ninnii* (short chelicerae with normal fangs) directed the attack to the ventral side of woodlice where it inserted both fangs. The attack was indirect, providing the woodlouse with an opportunity to roll itself up. In the case of an unsuccessful attack, *D. ninnii* had to wait until woodlouse unrolled again. *D. dubrovninnii* (short chelicerae with flat fangs) inserted the fangs under the dorsal tergites, no matter whether the woodlouse rolled or not. The fangs were able to penetrate between the tergites because they are both flat and elastic. Comparative analysis of the cheliceral morphology in other sister genera of the genus *Dysdera* suggested that short chelicerae with normal fangs are the most primitive. Elongated chelicerae and chelicerae with flat fangs are derived. These evolved as morphological adaptations for the capture of woodlice. We conclude that *Dysdera* spiders are able to capture various arthropods but possess morphological adaptations for capturing woodlice.

POSTER ABSTRACTS

Spider diversity of the Grassland Biome in South Africa (Arachnida: Araneae)
DIPPENAAR-SCHOEMAN, A.S. & HADDAD, C.R.

As part of the South African National Survey of Arachnida (SANSA) projects are underway to determine the diversity of the Arachnida fauna of South Africa. One such a project is an inventory of the spider fauna of the different floral biomes. In this study we report on the diversity and present status of the spider fauna of the Grassland Biome in South Africa. The Grassland Biome is found on the high central plateau of South Africa, including large parts of Gauteng, Mpumalanga, Free State, parts of North West, the inland regions of KwaZulu-Natal and Eastern Cape. This biome is dominated by a single layer of grass and absence of trees, except in a few localized areas. There are many unique spiders found having adaptations in body form, colour, and web and retreat construction. A total of 49 families represented by 209 genera and 400 species have so far been recorded. From the plant layer 21 families, 101 genera and 188 species are known, with the Araneidae, Thomisidae and Salticidae the more abundant and diverse families. From the ground layer 33 families, 108 genera and 312 species are known with the Gnaphosidae, Lycosidae and Idiopidae the more abundant and diverse groups. Threatened, rare, representative and flagship species are indicated for each layer.

The spider communities on three orchard crops in South Africa (Arachnida: Araneae)
DIPPENAAR-SCHOEMAN, A.S., HADDAD, C.R., VAN DEN BERG, A.M. & LOUW, S.VDM.

The spider communities on three orchard crops (macadamia, avocado and pistachio) in South Africa were compared. Spiders were collected from macadamia nuts and avocado from July 1997 to July 1998 in the Mpumulanga Lowveld, and from pistachio nuts in the Northern Cape from January 2000 to December 2002. The same collecting method (tree fogging with dichlorvos as a knockdown agent) was used in all orchards. Only in the pistachio orchards was additional searching conducted under bark and in dead leaves in the trees. In three macadamia orchards (17-19 samples each) a total of 2778 spiders (80 spp.) were recorded, 3715 spiders (90 spp.) were recorded from four avocado orchards (17-19 samples each), and 5803 spiders (87 spp.) were collected from three pistachio orchards (20 samples each). The Salticidae were the most abundant family in all three orchards, and represented 72.7% of the total in macadamia, 31% in avocado and 59.6% in pistachio. The thomisid *Oxytate argenteooculata* (Simon) was the most abundant species in the avocado (22.2%), while the salticid *Thyene coccineovittata* (Simon) represented 29.7% of the fauna in the macadamia, and the salticid *Heliophanus pistaciae* Wesolowska 53.8% of the fauna in the pistachio. Field

observations and laboratory studies indicated that they prey on various small arthropods such as mites, aphids, leafhoppers, lygaeid bugs and thrips and may play an important role in the control of various orchard pests.

The baboon and trapdoor spider database: a wealth of information (Arachnida: Araneae)
DIPPENAAR-SCHOEMAN, A.S. & KASSIMATIS, E.

As part of the South African National Survey of Arachnida (SANSA) several projects are underway to access the biodiversity of the Arachnida fauna of South Africa. One such a project deals with the suborder Mygalomorphae of the spiders. The first phase of the project was to compile baseline information in the form of a national species lists. The absence of species lists is a serious obstacle when it comes to determining the status of a group. For the first time an inventory on the mygalomorph families was made. It was found that South Africa has a rich fauna represented by 10 families, 28 genera and 281 species. During the second phase all available literature was reviewed and keys to the families, genera and species were developed. The third phase is now underway where the data gathered are used to answer questions on the diversity, endemism, conservation status, red data listing and the systematic position of the group. Data

are presented as handbooks, CD-ROMS, posters, scientific and non-scientific publications and on-line expert systems. The importance of sharing information is illustrated.

Spiders in citrus orchards in South Africa (Arachnida: Araneae)
DIPPENAAR-SCHOEMAN, A.S., VAN DEN BERG A.M. & STEPHENS P

Spiders are commonly found in citrus orchards and are known to prey on a variety of insect and mite pests. With increased interest in non-chemical control strategies, the need to understand this diverse group of organisms that might play a role in our agro-ecosystems is increasing. It is predicted that hundreds of potentially useful biological control agents are still unknown to man. But before they can be economically utilized, these organisms must be collected, studied and integrated into our information systems. Surveys of the araneofauna are therefore essential before experimental work can be carried out. Surveys of spiders in citrus orchards were undertaken sporadically over the past 20 years in South Africa and during this study the data were collated to get an overall view of the spiders in citrus orchards. Thirty-five families, represented by 135 genera and 198 species were recorded. The Thomisidae were the most diverse with 18 species, followed by the Araneidae (15 spp.) and Theridiidae (9 spp.). The wanderers constitute 61.5% of the spiders collected and the web dwellers 38.5%. This survey forms part of the South African National Survey of Arachnida (SANSA) in agro-ecosystems.

Our present knowledge on the Araneidae (Arachnida: Araneae) of the Afrotropical Region
KASSIMATIS, E.J.

As part of the African Arachnida Database (AFRAD), a database on the Araneidae of the Afrotropical Region has been compiled. This taxon database includes data on the genera and species presently known from the region as well as a digital picture database for each genus and distribution data for each species. This data will be available on the AFRAD website (www.arc-afrad.agric.za). This study also forms part of the South African National Survey of Arachnida (SANSA). The Araneidae is the third largest spider family known and is represented by 2824 species from 163 genera worldwide. They are an abundant group and form an integral part of the fauna in most floral biomes. The Afrotropical Region is currently represented by 63 genera and 363 species and subspecies, while South Africa is represented by 26 genera and 61 species, of which 27 are

endemic. Although the araneids have been the subject of much descriptive and revisionary work, including phylogenetic and evolutionary research worldwide, they are still poorly known in the Afrotropical Region and only about 16% of the genera have been revised recently. Mostly, there is an urgent need for a key to the genera.

Heterogeneity of spider assemblages in the Soutpansberg, Limpopo
MAFADZA, M.I, FOORD, S.H., VAN RENSBURG, B.J. & DIPPENAAR-SCHOEMAN, A.S.

Because of its unique geological history and biogeographical location, the Soutpansberg acts as a contemporary Noah's Ark. It is also part of an initiative to include it under UNESCO's Man and Biosphere Reserve Programme. A recent survey suggested that the spiders (Araneae: Arachnida) are particularly diverse in the region. Following on this, a one year study was initiated to determine heterogeneity of spider assemblages in five dominant habitat types in the Soutpansberg. Habitats were classified based on their structure. Spiders were sampled through pitfall traps, sweeping, beating, active search and leaf litter sifting. Certain microhabitat variables were measured to determine their effect on diversity and assemblage structure. Results based on preliminary analysis of data are discussed.

Hispaniolan spiders: extant and extinct compared
PENNEY, D.

Extant and extinct (in Miocene Dominican Republic amber) Hispaniolan spiders are compared graphically at family level using the evolutionary tree of Araneae. Overall, the two faunas are similar but some distinct differences are apparent. The families Cyrtaucheniidae, Microstigmatidae, Ochyroceratidae, Palpimanidae, Tetrablemmidae, Hersiliidae, Agelenidae, Anapidae and Mysmenidae are known only from amber, whereas Drymusidae, Deinopidae, Desidae, Amaurobiidae, Prodidomidae and Zoridae are known only from the extant fauna. Hispaniola is unique in that more spider families are recorded from fossil species than are recorded from extant species. Many spider families are known as fossils only from Dominican amber. Detailed comparisons of these faunas with other Neotropical faunas should allow us to elucidate the origins and palaeobiogeography of the Greater Antillean faunas, and also help us determine taxonomic biases associated with amber preservation.

Karyotype analysis and achiasmatic meiosis in European species of the genus *Atypus* (Mygalomorpha: Atypidae)
ŘEZÁČ, M.1. & KRÁL, J.

Karyotypes of mygalomorph spiders are largely unknown. Karyotypes of only six species belonging to six families have been published. In order to fill this gap, we have focused on the European representatives of the genus *Atypus*. The male karyotype of *Atypus muralis* and *A. piceus* comprises 41 chromosomes that are mostly metacentric; the female karyotype contains 42 chromosomes. Meiosis of both species is achiasmatic; this mode of meiosis has not been found in mygalomorph spiders yet. Sex chromosomes exhibit remarkable positive heteropycnosis during pachytene. The heteropycnotic sex chromosome is associated with one chromosome pair during the postpachytene, so these chromosomes are sex chromosomes too. The trivalent of the sex chromosomes dissociates after metaphase I. Both sexes of *A. affinis* possess 14 chromosomes. It is the lowest diploid number of chromosomes found in mygalomorph spiders. Four autosome pairs are metacentric, and t wo of them are very tiny. The last autosome pair is submetacentric. Two large metacentric chromosomes are odd in the male karyotype, so these are the sex chromosomes. However, sex chromosome system can not be common spider X1X20 type because both sexes possess the same number of chromosomes. The sex chromosome system is probably XY. Therefore, *A. affinis* differs remarkably from previous species both in the number of chromosomes and sex chromosome system. Moreover, pattern of constitutive heterochromatin and distribution of nucleolar organizing regions of *A. affinis* is also distinct. Furthermore, karyotypes of all the studied species differ significantly from the karyotype of *A. karschi* from eastern Asia, which comprises 42 acrocentric chromosomes including sex chromosome system X1X20 (Suzuki 1954). The karyotype composed of high number of chromosomes is probably plesiomorphic character in spiders (Suzuki, 1954). Therefore, karyotypes of *A. muralis* and *A. piceus* represent ancestral situation in comparison with the karyotype of *A. affinis*. The number of chromosomes corresponds with the important morphological character of the genus *Atypus*, i.e. the number of segments of the posterior lateral spinnerets (PLS). The PLS of species with the high number of chromosome s are composed of 4 segments (*A. muralis*) or the fourth segment is hinted (*A. piceus*). In contrast to this, the PLS of *A. affinis* are composed of 3 segments. The 3-segmented PLS are considered to be plesiomorphic in the genus *Atypus* (Schwendinger, 1990). Karyological data indicate that the 3-segmented PLS of *A. affinis* are derived and therefore, they established by fusion of the last two segments.

SPECIMENS WANTED

Several taxonomic studies are underway on African arachnids and specimens of the following families are wanted;

- Richard Gallon is busy revising the genera of Theraphosidae and looking for material of the genera: *Harpatira, Harpactirella* and *Brachionopus.*
- Charles Haddad is looking for specimens of the Corinnidae.
- Ansie Dippenaar-Schoeman is looking for thomisids.
- Mark Alderweireldt and Jean-Francois van der Donckt is looking for ctenids.
- Leon Lotz is looking for more archaeids and miturgids (*Cheiramiona* and *Cheiracanthium*).

PS Now everyone must start looking for oonopids!

WE CAME TO THE END OF ANOTHER VERY BUSY YEAR AND A TOO LONG NEWSLETTER. THE COMMITTEE HAVE THEREFORE DECIDED TO BRING OUT TWO ISSUES OF THE NEWSLETTER NEXT YEAR.
WITH THE ASSISTANCE OF CHARLES HADDAD A SECOND ISSUE (JUNE-JULY) WILL BE DISTRIBUTED.

FOR THIS ISSUE YOU ARE WELCOME TO SUBMIT ANY TYPE OF NEWS ITEMS TO US E.G. SHORT NOTES ON INTERESTING ARACHNID BEHAVIOUR, AND ABSTRACTS OF PAPERS. WE'LL ALSO USE THIS ISSUE ANNUALLY TO REPORT BACK ON SURVEYS!

BEST WISHES FOR 2006