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No 70

Plant Protection Research Institute

PLANT PROTECTION NEWS

Newsletter of the Plant Protection Research Institute (PPRI), an institute in the Public Support Services Division of the Agricultural Research Council (ARC) of South Africa.

Inside this issue:

General inquiries

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Pompom weed threatens the Waterberg

Pompom weed (*Campuloclinium macrocephalum*), a South American invader of grasslands in South Africa, now threatens the relatively pristine Waterberg region in Limpopo Province. A survey in December 2006 by Lesley Henderson and Hildegard Klein revealed an extensive infestation of pompom weed on the Welgevonden Private Game Reserve which borders on the Marakele National Park. Pompom weed was first noticed on Welgevonden only three years ago and the current infestation in the valley of the Grootfonteinspruit follows a burn in November 2005. The Welgevonden managers are aware of the problem and are committed to controlling pompom weed. Unfortunately the spread of pompom weed has been so rapid that now plants occur almost throughout the 33 000 hectare reserve.

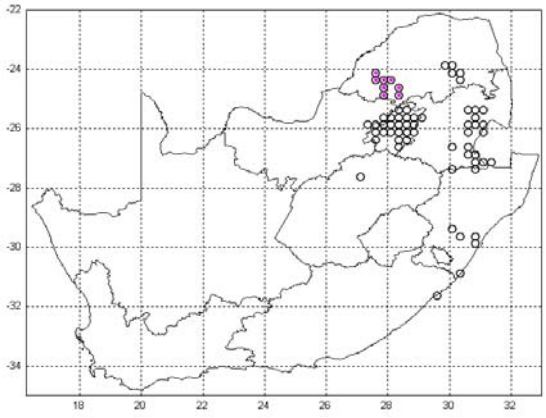
The first record of Pompom weed in the Waterberg, near Kareefontein north east of Rooiberg, was submitted to the SAPIA (Southern African Plant Invaders Atlas) database in January 1999. This site is approximately 30 km due south of Welgevonden. Other records of pompom weed prior to December 2006 were near the entrance to Mabula Game Reserve in January 2002, Vaalwater in February 2003 and Groot Nyloog south west of Modimolle (previously Nylstroom) in February 2006. New localities recorded in December 2006 are on the Hoopdal–Tweeloopfontein road on the northern border of the Marakele Contractual

Pompom weed infestation, Welgevonden

The pattern of invasion by pompom weed in the Waterberg is similar to that in Gauteng where it initially establishes on disturbed sites, particularly roadsides, abandoned fields and urban open space and then invades grasslands, open savanna and wetlands. Another invasive alien plant, purple top (*Verbena bonariensis*), is often associated with pompom weed and its presence in an area is a good indicator of suitable habitat for pompom weed.

Read more about pompom weed on pp 13-14.

Any new sightings of pompom weed in the Waterberg can be sent to Lesley Henderson at HendersonL@arc.agric.za. Include date, GPS or approximate locality, habitat and abundance.



Distribution of pompom weed in South Africa with Waterberg sites in pink.

Pompom weed flowerheads and seeds

"Know the names of your friends and your enemies"

This was the intriguing title of a series of displays produced by PPRI' s Biosystematics, Weeds and Insect Ecology Divisions for the University of the Witwatersrand's *Yebo Gogga Yebo AmaBlomo* 2006 exhibition, held during the first week of October.

The annual show put on by the University under the auspices of the School of Animal, Plant & Environmental Sciences, gives various organisations a chance to expose children and members of the public to aspects of biology, particularly "goggas" (insects). This year the theme was "Umuthi" (medicine) so the role of insects, plants and animals in healing, and the danger they cause were explored, including the use of indigenous plants and insects in traditional medicine in South Africa. Thousands of school children visited the exhibits during the week, while younger children were brought by their parents over the weekend.

Children have no fear of insects and marvelled at the display "Who are you sleeping with", then enthusiastically clambered onto boxes to take a look at insects displayed under the microscope. They quite fearlessly held wriggling maggots and spiky caterpillars and looked at all the spiders found in a garden. The correct name for the 'mango' fly was explained as well as the biology of the rat-tailed maggot, both much in the newspapers this past year. Many parents were intrigued by the wasps used for biological control of weeds and insect pests as well as displays of good and bad fungi. Elme Breytenbach co-ordinated PPRI's contribution and manned the stalls together with two Wits service students.

Interested children

Elme Breytenbach co-ordinated PPRI's exhibition

Biologists are said to be made between the ages of 6 to 14, so it is essential that children are given the chance to experience such displays. They may end up being our future entomologists and mycologists.

Ros Urban at UrbanR@ arc.agric.za

Ph.D. degree awarded to Janine Kelly

Janine Kelly, who began working at the National Collection of Insects in June this year, was awarded her Ph.D. degree by the University of the Free State on 14 September. The title of her thesis was "The influence of clothing, wrapping and physical trauma on carcass decomposition and arthropod succession in central South Africa", and her project was supervised by Prof T.C. van der Linde.

Janine's study is a contribution to our understanding of the colonization of decomposing bodies by arthropods, and the calculation of postmortem intervals for use in criminal investigations. The results of her project showed that clothing, wrapping and physical trauma do not influence carcass decomposition and arthropod succession during the warm months of the year. However, in some cases the succession of the arthropods was altered due to extensive maggot mortality which occurred on wrapped carcasses, when the area experienced high temperatures. In winter, only the wrapped carcass trials exhibited a time delay, of four days. Added to this in winter, the carcasses remained acceptable to Diptera for oviposition over an extended period, which extended the arthropod succession. There were various differences in the tissue utilized by the arthropods as a result of the absence or presence of clothing or wrapping.

The results from this research have already been successfully used in some criminal cases, and three manuscripts are currently in preparation for forensic science journals.

Dr Janine Kelly at KellyJ@arc.agric.za

Retirement & resignation

Dr Esther van den Berg

Dr Esther van den Berg, a specialist scientist and programme leader in the Biosystematics Division of the ARC-Plant Protection Research Institute retired end of November after 42 years of service.

Esther matriculated in 1959 at Langenhoven High School in Pretoria. She completed her BSc at the University of Pretoria with Zoology and Entomology as her major subjects and finished her MSc in 1965. Her PhD at the Rand Afrikaans University (now University of Johannesburg) was obtained in 1974.

She start working at the then Agricultural Technical Services in 1963 as entomologist and was transferred to PPRI in 1968. She became a world specialist of the nematode families and superfamilies: Hoplolaimoidea, Pratylenchidae, Criconematoidea and Tylenchulidae and made a big contribution in Nematode research in South Africa. Having been a founder member of the Nematological Society of Southern Africa, she attended all 17 biennial congresses of the Society. In 2001 she was made an honorary member.

During her career she published 115 peer-reviewed scientific articles in local and overseas journals and 27 semi-scientific papers and abstracts; she was co-author of a handbook on nematodes and contributed a chapter in the Science Bulletin “Nematology in Southern Africa” by D.P. Keetch & J. Heyns (1982). She attended congresses of the European Society of Nematologists in Ireland, Scotland, Belgium and Portugal, frequently using her own funds. She received a Rhone Poulenc award for her research in 1997.

Fortunately for PPRI, Esther will continue to be associated with us as a Research Associate, continue with her research and publish papers to the credit of PPRI. We all wish her well.

The Nematode team at Esther’s farewell

Sidwell Banne

Sidwell Banne resigned end of October 2006. Sidwell started working for PPRI as an assistant in the bee research section in 1985, but his career really came to life when he started beekeeping development work under the guidance of Paul Magnuson and began to introduce the art of beekeeping to previously disadvantaged rural communities. The beekeeping development for poverty relief programme flourished, and under the leadership of Elize Lundall-Magnuson became one of the most important and lucrative programmes in PPRI. During the past 15 years Sidwell and his colleagues trained over 2000 rural beekeepers and helped alleviate poverty in previously disadvantaged communities all over country. The beekeeping programme brought much recognition and credit to ARC-PPRI and received a number of national and international awards, including the Dubai award for sustainable agricultural projects, the Impumelo platinum 2002 award, as well as being a finalist in the SA Home Grown Awards.

Sidwell’s career was characterized by hard work, perseverance and dedication to his job. Sidwell’s main aim in life was to train new beekeepers and to help alleviate poverty. He became well respected within the beekeeping communities and by the funders who continued to finance these projects based on the tangible benefits to the communities. The highlight of the recognition from his beekeeping peers for his valuable contribution to beekeeping was his award as the BECON Bing Wiese bee researcher of the year 2006.

Sidwell is an example of how people with potential and drive, and when given the right opportunity, can make a great success of their careers. We at PPRI are proud that he achieved so much with us and we wish him well with his beekeeping business ventures in future.

Sidwell Banne

Best wishes to Eunice Mudzuzi, previously from PPRI who was transferred to be Transport Officer at the Institute of Soil Climate and Water.

New Appointments

New faces at PPRI

Mariette Truter

Mariette Truter was appointed as a researcher at the Mycology Unit, Biosystematics on 1 December 2006. She filled the position left vacant by Oloff O'Brien, who resigned in November 2005. She will do taxonomic research of the genera *Aspergillus* and *Penicillium* as well as the hyaline Hyphomycetes, and is the new project leader of the Kruger National Park survey.

She will also be responsible for the databases and web page and will be put in charge of running the Identification Service of the Mycology Unit later during the year.
Mariette obtained her M.Sc. at the University of Pretoria and is currently enrolled for a Ph.D. She was previously employed in the Department of Microbiology and Plant Pathology, University of Pretoria, and was responsible for practical training in mycology and plant pathology courses. We would like to welcome her in our midst and hope that she will enjoy her new position!

Simangele (Sma) Mathebula

Simangele Mathebula, or Sma as she is called by her friends, is the new research assistant at the Spider Research Centre.

She is from KwaZulu-Natal where she has studied at the University of KwaZulu-Natal. She is still busy with her BSc degree and hopes to add Zoology as a major next year. Her duties include assistance with the curation of the National Collection of Arachnida, support with the South African National Survey of Arachnida and assistance with surveys.

Cara-Mia Dippenaar

The friendly new face at the Nematology Section at Rietondale belongs to Cara-Mia Dippenaar.

Cara-Mia was appointed for a year as a data capturer to help with the digitisation of the National Collection of Nematodes. Her appointment is funded through a NDA project. She started capturing the data contained in the *Meloidogyne* collection and has already captured a large number of the specimen data in this collection.

Palesa Lesupi

Welcome to Palesa Lesupi, who start working at PPRI on 1 November 2006 as receptionist.

She was born in Orkney in the North West Province and matriculated at Vaal Reefs Technical High School. She worked as a receptionist at Telesure Investment Group Services in Brooklyn Pretoria as well as for the TCH Bonisa Business Centre. Palesa was enrolled for her BA degree at Vista and could unfortunately not complete the final year.

Plant Protection Research Institute Initiatives

African Pollinator Initiative

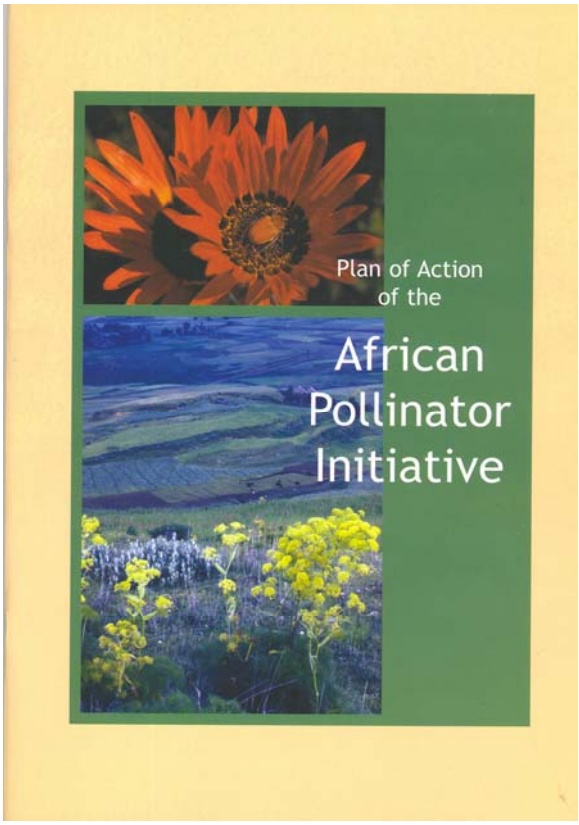
The African Pollinator Initiative (API) was initiated by Dr **Connal Eardley** in January 1999 to enable African countries to work together to implement the International Pollinator Initiative's (IPI) Global Environment Facility (GEF) project in Africa. It was the first regional pollinator initiative.

It was highly successful in that three African countries, namely Ghana, Kenya and South Africa, joined Brazil, Nepal, India and Pakistan to develop a global project for the "Conservation and Management of Pollinators for Sustainable Agriculture through an Ecosystem Approach". The project proposal is now complete and currently awaits a decision from the GEF. South Africa's activities will be co-ordinated by the South African National Biodiversity Institute (SANBI) at Kirstenbosch, Cape Town.

API has exceeded its expectations by becoming an ongoing pan-African Initiative for communication between groups with a common interest in pollination and pollinator biodiversity conservation. It uses BioNET-International's network structure: SAFRINET, for southern Africa, EAFRINET, for East Africa, WAFRINET, for West Africa, and NAFRINET, for North Africa.

In 2002 API held its first Workshop to develop an API Plan of Action. Since then a host of activities, in many different African countries, have taken place, including awareness, research, policy development and capacity building. API cannot report on all the projects, because it does not co-ordinate activities. Previously it was administered through the Environmental Liaison Centre International (ELCI), but as the interested parties there have left ELCI, the ARC will soon host an API website to facilitate communication and highlight work on pollination and pollinators.

Dr Connal Eardley at EardleyC@arc.agric.za



Front cover of the API Plan of Action that will soon be published on the API web site

News Flashes

PPRI –Web site

PPRI can be very proud of the results for the ARC Web Statistics for the past few months. PPRI featured prominently on the list of the 24 Top requested pages of the ARC (Sep-Nov).

Of all the ARC-Institutes PPRI was first on the list with 38 337 hits; the Weeds Research Division of PPRI was 10th of the top requested ARC sites with 16 046 hits; the spiders webpage of the Biosystematics Division was 19th with 10 647 hits and the webpage on plant feeding mites, also within the Biosystematics Division, was 22nd with 7 642.

Congratulations

To Ansie Dippenaar-Schoeman of the Biosystematics Division who has been elected as a fellow of the Royal Society of South Africa. The society has at its aim the furtherance of all aspects of science and is the oldest multi-disciplinary science based Society in South Africa.

Persons who have done outstanding work in the furtherance of Science in South Africa, as evidence by publications may be elected by other fellow to the Fellowship of the Royal Society.

Refereed publications

DIPPENAAR-SCHOEMAN A.S. 2006. New records of 43 spider species from the Mountain Zebra National Park, South Africa (Arachnida: Araneae). *Koedoe* 49: 23-28.

DIPPENAAR-SCHOEMAN A.S., GONZALEZ-REYES A.X. & HARVEY M.S. 2006. A check-list of the Solifugae (sun-spiders) of South Africa (Arachnida: Araneae). *African Plant Protection* 12: 70-92.

DIPPENAAR-SCHOEMAN A.S. & GONZALEZ-REYES A.X. 2006. South African National Survey of Arachnida (SANSA): Solifugae (sun-spiders) of the national parks and reserves of South Africa (Arachnida, Solifugae). *Koedoe* 49: 29-38.

DIPPENAAR-SCHOEMAN A.S. & WASSENAAR T.D 2006. A checklist of spiders from the herbaceous layer of a coastal dune forest ecosystem at Richards Bay, KwaZulu-Natal, South AFrica (Arachnida: Araneae). *African Invertebrates* 47: 63-70.

EARDLEY C.D. 2006. The southern African species of *Andrena* Fabricius (Apoidea: Andrenidae). *African Plant Protection* 12: 51-57.

EARDLEY C.D. & KUHLMANN M. 2006. Southern and East African *Melitta* Kirby (Apoidea: Melittidae). *African Entomology* 14: 293-305.

FOORD S.H. & DIPPENAAR-SCHOEMAN A.S. 2006. A revision of the Afrotropical species of *Hersilia* Audouin (Araneae: Hersiliidae). *Zootaxa* 1347: 1-92.

HADDAD C.R., DIPPENAAR-SCHOEMAN A.S. & WESOLOWSKA W. 2006. A checklist of the non-acarine arachnids (Chelicerata: Arachnida) of the Ndumo Game Reserve, Maputaland, South Africa. *Koedoe* 49: 4-22

HUSBAND R.W., CAMERIK A.M. & STALS R. 2006. Two new species of *Regenpolipus* and distribution of *Eutarsopolipus lukoschusi* and *Regenpolipus* species (Acari: Podapolipidae), ectoparasites of *Thermophilum decemguttatum* and *Anthia* species (Coleoptera). *International Journal of Acarology* 32: 361-370.

KHANJANI M. & UECKERMANN E.A. 2006. A new species of the genus *Neophyllobius* Berlese (Acari: Camerobiidae) from Iran. *International Journal of Acarology* 32: 277-281.

KLUGE R.L. & ZACHARIADES C. 2006. Assessing the damage potential of the stem-boring weevil *Lixus aemulus* for the biological control of *Chromolaena odorata*. *Biocontrol* 51: 547-552.

SIMELANE D.O. 2006. Effect of herbivory by *Teleonemia scrupulosa* on the performance of *Longitarsus bethae* on their shared host, *Lantana camara*. *Biological Control* 39: 385-391.

SIMELANE D.O. 2006. Suitability of some *Lantana camara* varieties as host plants for the root-feeding beetle, *Longitarsus bethae*. *Biocontrol Science and Technology* 16: 971-979.

UECKERMANN, E.A., VAN HARTEN, A. & SMITH MEYER, M.K.P. 2006. The mites and ticks (Acari) of Yemen: an annotated check-list. *Fauna of Arabia* 22: 243-286.

VAN DEN BERG E. & TIEDT L.R. 2006. One new and some known nematode species from Namibia with a description of the male of *Criconema pacificum* (Andrássy, 1965) Raski & Luc, 1985 from Rwanda (Criconematidae: Nematoda). *Journal of Nematode Morphology and Systematics* 8: 103-120.

VAN DEN BERG E. & TIEDT L.R. 2006. First report of *Eutylenchus africanus* Sher, Corbett & Colbran, 1966 from Namibia (Nemata: Tylenchidae). *Journal of Nematode Morphology and Systematics* 8: 73-79.

WOOD A.R. 2006. New and interesting records of southern African rust fungi (Uredinales). *SA Journal of Botany* 72: 534-543.

Other publications and reports

DIPPENAAR-SCHOEMAN A.S. 2006. 'n Noodhulpkissie vir spinnekoppe. *Afgriland* Nov/Dec: 56-57.

DIPPENAAR-SCHOEMAN A.S., VAN DEN BERG A. & VAN DEN BERG A.M. 2006. Newsletter of the African Arachnological Society no. 19. 1-16.

Courses & Lectures

DIPPENAAR-SCHOEMAN A.S. 2006. Specialist weekend training course presented at Ezemvelo Nature Reserve funded by E. Oppenheimer & Son.

GORDON J.A. 2006. Principles and practice of biological weed control with special emphasis on fynbos weeds. Lecture to final year Nature Conservation Students. Cape Technikon.

Workshop contributions

McCONNACHIE A.J. & STRATHIE L.W. 2006. [PAPER]. Distribution and potential spread of *Parthenium* in South Africa and Swaziland. Second Partners Planning and Reporting Workshop. Virginia State University, USAID, IPM CRSP. Ethiopia.

NOFEMELA R.S. & KFIR R. 2006. [PAPER] The pest status of Diamondback Moth and the role of *Cotesia plutellae* in suppressing the pest populations in South Africa. Proceedings of the 5th International Workshop on Management of the Diamondback Moth and Other Crucifer pests. Beijing, China.

Talks at other meetings

ALLSOPP M.H. 2006. Beekeeping in New Zealand. Southern Cape Beekeepers' Day. SCBA.

ALLSOPP M.H. 2006. Beekeeping in South Africa. Bienne Donne Expo 2006. ARC-Infruitec.

ALLSOPP M.H. 2006. DFPT Pollination Projects. Southern Cape Beekeepers' Day. SCBA.

ALLSOPP M.H. 2006. DFPT Pollination Projects 2003-2006. Lourensford Estate Feedback Session.

DIPPENAAR-SCHOEMAN A.S. 2006. Introduction and background on SANSA. Institute meeting. PPRI.

DIPPENAAR-SCHOEMAN A.S. 2006. Talk on SANSA to the Spider Club. Saturday morning meeting of Spider Club.

DIPPENAAR-SCHOEMAN A.S. 2006. Why are spiders more intelligent than trees. Monthly meeting of Mountain Club.

DIPPENAAR-SCHOEMAN A.S. 2006. Wonder wêreld van die spinnekop. Voortrekker saamtrek. Laerskool Wonderboom.

URBAN R.P. 2006. The National Collections. Yebo Gogga Yebo Amablomo UMUTHI. University of the Witwatersrand.

URBAN R.P. 2006. What's in a name. Yebo Gogga Yebo Amablomo UMUTHI. University of the Witwatersrand.

Media

Radio talks and TV presentations

During the period October– December 2006 a total of 19 radio talks were broadcast on research undertaken at PPRI.

Dr **Ansie Dippenaar-Schoeman** continued with her weekly live broadcasts that are transmitted every Tuesday on *Radio Laeveld.* A total of 14 talks were broadcast during this period. As part of the panel of "*Hoe verklaar jy dit*" of *RSG*, four talks were broadcast and one on Radio Pretoria.

Other Media exposure

Press Releases

DIPPENAAR-SCHOEMAN A.S. 15/12/2006. New Baboon spider discovered in survey of Kruger National Park. *Kruger Park Times* 3(16): 1-2

DIPPENAAR-SCHOEMAN A.S., 8/12/2006. Spider Snapshots wanted. *Kruger Park Times* 3(16): 16

Short courses for two quarantine entomologists

Two quarantine officers, Davina Muller and Saadiek Rosenburg from SAAFQIS (South African Agriculture & Food Quarantine Inspection Services) in Stellenbosch, attended two courses at PPRI—Biosystematics

A 5-day course at the National Collection of Insects was presented to them from 13–17 November. The purpose of their visit was to hone their technical skills in the processing and identification of intercepted quarantine organisms. They also interacted with the Entomologists at the NCI and received training from the various taxonomic specialists, who are tasked with providing SAAFQIS with diagnostic support.

They then attended a 3-day course (5-7 December 2006) in acarology presented by Charnie Craemer of the Arachnology Unit. Mites are particularly problematic in plant quarantine due to their microscopic size. The course consisted of an introduction to plant feeding mites with emphasis on plant quarantine. The rest of the course particularly focused on the detection of mites, correct sampling methods, recognizing plant feeding groups, and understanding their biology, ecology and phytosanitary importance. They each received a comprehensive manual to assist them in their work.

Ros Urban (National Collection of Insects) UrbanR@arc.agric.za
Charnie Craemer (National Collection of Mites) CraemerC@arc.agric.za

Davina Muller and Saadiek Rosenburg

Biosystematics Division

PPRI participated in the Maloti-Drakensberg Transfontier Conservation and Development Project (MDTP)

The Maloti-Drakensberg Transfontier Conservation and Development Project (MDTP) is a collaborative initiative between the Kingdom of Lesotho and South Africa to protect the exceptional biodiversity of the Drakensberg and Maloti mountains through conservation, sustainable resource, land-use and development planning. The five-year project, which began in 2003, is funded by the Global Environment Facility to the tune of R120 million, with the World Bank as the implementing agency. The Maloti Drakensberg Transfrontier area is a 300km-long alpine and mountain zone along the borders of Lesotho and South Africa. The project is the latest in a list of transfrontier areas between South Africa and surrounding countries. Like all other transfrontier parks, the Maloti Drakensberg project faces a challenge to conserve the unique mountain region while ensuring that the development needs of local populations are met.

As part of the project the terrestrial invertebrates were surveyed - a project implemented by the Inland Invertebrate Initiative, and administered by the University of Natal. The aim of the project was:

1. To provide basic inventory information on terrestrial invertebrates in the Drakensberg using a stratified survey approach.
2. To advise on invertebrate diversity conservation planning.
3. To advise on the possible effect of human intervention on biodiversity.
4. To provide the foundation for research into the processes effecting invertebrate diversity.

The project focused only 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, (5) have high levels of endemism and (6) will most likely be of high conservation priority in the Drakensberg.

Three researchers **Ansie Dippenaar-Schoeman** (spiders), **Connal Eardley** (bees) and **Michael Stiller** (leafhoppers) at the Biosystematics Division took part in this project. They helped to identify species that could act as indicators of ecological processes and environmental health and to provide ecologically sound habitat and distribution data for selected invertebrate taxa. They also assisted with the interpretation of invertebrate biodiversity in the Drakensberg in terms of patterns of endemism, biogeography, and phylogenetic distinctiveness. All the collected material will be deposited in the National Collections.

The project was designed around a strategy of sampling of a large number of sites over a relatively short period of time. This was 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. 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 and functionality, and have high potential as indicators of ecological (rather than biodiversity) processes.

Dr Ansie Dippenaar-Schoeman at DippenaarA@arc.agric.za

Spiders: A total of 6500 spiders were identified represented by 32 families and 130 species. The region has a unique fauna and several new species have been collected.

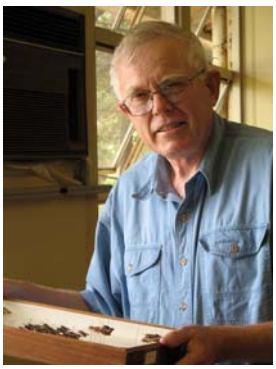
Bees: A total of 1171 specimens were identified with representatives of 26 genera and all six of the South African families.

Leafhoppers: represented by one family and so far 3425 specimens from grassland habitats have been examined that amount to about 60 genera and 140 species. In three genera found in these samples there are at least 25 new species, that form part of an examination of the fauna of the grassland biome of South Africa.

Visitor to the National Collection of Insects

Dr Daniel Otte, Curator of Entomology at the Academy of Natural Sciences of Philadelphia in the U.S.A., visited various divisions of PPRI during November. He has done extensive research on Orthoptera (grasshoppers and locusts) in many parts of the world, and has now turned his attention to the rich fauna of southern Africa. PPRI has a fine collection of grasshoppers, which was assembled mainly by Dr Dick Brown during his long career at the Institute. Much of this material has yet to be studied and described. While collecting orthopteran insects in the Karoo, Dan Otte was fortunate to see a huge swarm of locusts, a new experience for him.

Dan is the author of many papers on Orthoptera, including two volumes on the North American grasshoppers belonging to the family Acrididae. He is also the founder and principal author of "*Orthoptera Species File Online"*, an extensive world-wide taxonomic database of orthopterans. He plans to add the South African species in the PPRI Orthoptera collection to this database, and expects to find that many of these species are new to science.



Ros Urban at UrbanR@arc.agric.za

First Birthday of the Nematode System

Since the Nematode System was made live on the 15th of December 2005, much has already been accomplished. Jenny Keytel of ARC's Information and Communication Technology (ICT) Division developed the nematode system to manage the National Collection of Nematodes. This collection contains the National Collection of Nematodes, the RAU Collection (a complete collection donated by the late Prof Juan Heyns of the Rand Afrikaans University) and the *Meloidogyne* Collection. It also incorporates all the information from the South African Plant-Parasitic Nematode Survey (Plant Protection News 67).

Naomi Buckley entered the data of 399 nematode species into the system, type material of which is deposited in two nematode collections. This entailed capturing the data from ± 3000 different specimens.

Cara-Mia Dippenaar captured the data from ± 7000 *Meloidogyne* specimens deposited in the *Meloidogyne* collection.

Dr Mariette Marais at MaraisM@arc.agric.za

Biosystematics Division (continued)

Technical Panel on Diagnostic Protocols meet in Valencia, Spain

Dr **Esther van den Berg** attended the 3rd meeting of the Technical Panel on Diagnostic Protocols in Valencia, Spain, from 16-20 October 2006. As signatory member to the World Trade Agreement on the Application of Sanitary Measures (WTO-SPS) as well as the International Plant Protection Convention (IPPC), South Africa is obliged to participate in the standard setting processes which included the developing of diagnostic protocols for quarantine pests.

In the first meeting in York nineteen pests had been identified for attention and at the second meeting in Malaysia only eleven had been ready for discussion due to problems with authors. Three different protocols had been reviewed in detail and the outcome had been that none of these protocols were ready for handing in. It had been decided that work on them should continue as well as work on the rest of the protocols.

The present meeting of the Technical Panel took place at the "Instituto Valenciano de Investigaciones Agrarias" in Valencia, Spain. Seven panel members, two newly elected panel members and two authors of protocols attended the meeting. After in-depth reviewing the panel decided that the protocols for the Plum pox virus and *Trogoderma granarium* would be, after some editing, ready for processing further and would eventually go for the 100 days country consultation process. After having reviewed four more protocols briefly, it was decided to review the "Instructions to authors" to make them easier to understand. This required some lengthy discussions when it was realised that, because of great differences amongst the various organisms, one set of instructions would not fit all. The new instructions will be finalized at the beginning of 2007.

Numerous other matters were discussed, such as membership of drafting teams, outlay of the protocols, how to deal with the country comments when they start coming back etc. No new protocols were added to the list and it was decided to rather get a few accepted first before new topics were implemented. The panel also expressed their concern that, with such lengthy procedures, the authors may get exasperated from not getting their protocols accepted and printed, and may not be interested to participate any more.

Mariano Cambro (Host - Spain), Maria Lopez (Protocol author- Spain), Lum Keng-Yeang (Malaysia), Esther van den Berg (South Africa), front - Yin Liping (China), Back - Hans De Gruyter (The Netherlands), Ana Lia Terra (Uruguay), Gerard Clover (New Zealand), Brent Larson (IPPC Secretariate Italy), Jane Chard (IPPC Secretariate - UK), Jens-Georg Unger (Germany)

The two authors of protocols who attended the meeting were a great help to the panel as they could discuss how they experienced the drafting of a protocol, the problems they encountered etc. It was then decided that in future, where possible, the meetings should be held in an area where some of the authors of protocols are stationed so that they can be invited to the meetings.

The two new members for fungi and botany were welcomed and some good input was received from them, especially from one of them who has experience with EPPO protocols. The work program for the next year was finalized and it was decided that the next meeting will be held at the end of September 2007, possibly in Buenos Aires, because of the presence of some of the authors in that area.

Dr Esther van den Berg at VDBergE@arc.agric.za

"Catch them before they kill us"

The Biosystematics Division plays a very important role in the early identification of harmful organisms. The following nematodes were of special interest:

* *Scutellonema bradys*, an economically important nematode, was found in yams imported from Nigeria.
* *Ditylenchus destructor*, a quarantine pest, was found on *Liatris* var. *callilepsis* bulbs from Bronkhorstspruit.
* *Ditylenchus africanus,* an economically important nematode on peanut, was found for the first time in the Krugersdorp area.

Dr Antoinette Swart at SwartA@arc.agric.za

Spiders used as indicator group

A total of 550 spiders, represented by 45 species, were identified from the Kruger National Park as part of a project 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. Groups of species that are characteristic of each *O. stricta* invasion level (indicators) were identified, 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 project is run by the University of Pretoria in conjunction with the Invasive Alien Research Programme (IAS).

In a second project a total of 450 spiders represented by 48 species was identified from the Hluhluwe/iMfolozi Nature Reserve as part of a survey by the University of Pretoria to study spiders as bioindicators on the effect of the invasive plant *Chromolaena odorata* on invertebrate diversity. Nearly all the protected areas in KwaZulu-Natal have already been aggressive colonizer by this weed. Historical maps showing *C. odorata* invasion within the reserve were analysed and areas that have been invaded for *ca* 20, 10 years and less than 1 year were identified and sampled. This study also determined the effects of mega herbivores on invertebrate diversity; compared the diversity and density patterns of spiders in relation to the different rainfall regimes of Hluhluwe/ iMfolozi and also determined the difference between the diversity indices of the different grass types.

Dr Ansie Dippenaar-Schoeman at DippenaarA@arc.agric.za

Biosystematics Division (continued)

PPRI participates in the BIOTA East Africa Bee/Pollination Course

BIOTA East Africa is a biodiversity project which is being carried out by the German government in Kakamega Forest, Kenya. An important aspect of this project concerns pollination, and pollinator biodiversity. BIOTA has identified a need to build capacity in pollination biology in Kenya. Because BIOTA has members with outstanding expertise in this field, it presented a course in bee identification and pollination research methodology in Nairobi, Kenya. The course was held from 27 September to 20 October 2006, and was attended by 12 students, 2 technicians and 2 assistants from the University of Nairobi, Jomo Kenyatta University, and the National Museums of Kenya (NMK). The bee identification module was presented from 27 September to 6 October by Connal Eardley of the ARC, and Mary Gikungu of NMK. Manfred Kramer, of Bielefeld University in Germany, taught the pollination module. The interest in the course clearly demonstrated a keen interest in pollination and bee systematics in Kenya – most of the course participants were post-graduate students or museum curators. Clearly Kenya has recognized the importance of pollination for agriculture and biodiversity conservation, having pollination curricula in its universities with pollination/pollinator projects in agriculture, reducing the spread of alien invasive species and the conservation of natural areas. Their eagerness to become involved in this growing field of research will surely be of great benefit in the future, and the ARC/NMK partnership will benefit both parties for many years to come.

Dr Connal Eardley at EardleyE@arc.agric.za

Participants and teachers at the BIOTA East Africa Bee/ Pollination course (Connal Eardley at extreme right of back

The National Collection of Insects contributes to the Global Biodiversity Information Facility (GBIF) Pollinator Project

A great deal of valuable information is associated with the specimens that are stored in biological collections, such as the large national collections of organisms at the ARC. But much of this information is only available to people who have access to the specimens in these collections.

The Global Biodiversity Information Facility (GBIF) was created about 5 years ago to make specimen information more widely available, so that it can be used for decision making by politicians, agriculturists and conservationists. South Africa is a member of GBIF, and its GBIF node is called SABIF. The ARC is a member of SABIF. During 2006 GBIF decided to focus on two or three globally important themes, and pollinators was one of them – within the pollinators, bees are their chief area of interest. Their aim is to have a catalogue with all the bees in the world (currently 80% complete) and 1 million specimens databased by March 2007. The ARC has contributed a recently-completed catalogue of the bees of sub-Saharan Africa and the East Indian Ocean Islands. This catalogue includes 2 714 bee species and about 50 000 specimen records, and is the work of Connal Eardley and Ros Urban. Apart from providing data, Connal Eardley has played a major role in encouraging GBIF to focus on pollinators, and in the development of this project.

Dr Connal Eardley at EardleyC@arc.agric.za

***Xylocopa inconstans* visiting a cow-pea flower in Kenya. (photo by Dino Martins)**

Other SABIF projects at PPRI

SABIF is the South African node of The Global Biodiversity Information Facility (GBIF). They provide funding to digitize specimen collections capturing the valuable primary data collected with the specimens.

The Fungal Collection received R50 000 for the 2005-2006 period to digitize their collection. The Spider Collection received R50 000 for the 2006-2007 period and another R60 000 for the 2007-2008 period.
On completion, this data will be made available through a portal to the world.

Part of the National Collection of Arachnida

Insect Ecology Division

ICOSAMP: Monitoring the distribution of migratory pests

Margaret Kieser, coordinator of ICOSAMP, with researchers of the University of the Witwatersrand (WITS), undertook a trip to the Central Karoo Region in October 2006 to survey the seriousness of the brown locust outbreak, but more specifically to look for any unhatched locust egg pods.

Front page photo by M Kieser

Their first contact with hopper bands after leaving Pretoria was on the Potfontein dirt road about 10 km before De Aar. This large band consisted of a mix of 3rd to 5th instar hoppers. They spent several hours in collecting hoppers and looking for egg beds along the Richmond road. The area was so densely populated with hoppers that they could not distinguish one band from another. Hopper sizes varied from 1st instars to 4ths. An enormous marching band of hoppers (2-3rd instars) moving in an easterly direction was estimated to be about 30 m wide and more than 220 m long!

From here to the town of Richmond - a distance of about 70 km - they drove through another 42 hopper bands (2nd, 3rd, and 4th instars) which were crossing the road from W to E. The Locust Officer at Richmond mentioned that this was the worst outbreak he has witnessed in 37 years of locust control.

To summarise, based on the number of hoppers seen, and the number of reports received at Upington and De Aar office, this season may just be one of the worst plagues experienced in South Africa in 20 years.

Margaret Kieser at KieserM@arc.agric.za

Locusts waiting for a train

Researchers attend workshop in China

The diamondback moth (DBM) is the most injurious insect pest of crucifer crops such as cabbage, canola, cauliflower, broccoli etc. in South Africa and most other countries in the world. In view of this Dr Rami Kfir and Robert Nofemela, a researcher in the Insect Ecology Division, attended the 5th International Workshop on Management of the Diamondback Moth and Other Crucifer Pests, Beijing, China in October 2006 to promote further cooperation with scientists from other countries. This workshop was attended by 120 researchers who represented national governments, research institutions and universities from many parts of the world. Forty three papers and 34 posters were presented. Robert delivered an oral presentation. An important new development that was also discussed at the workshop is the adaptation of DBM to host plants other than crucifers, such as peas and chilies, but the mechanisms to enable them to feed on plants other than crucifers still needs to be ascertained.

Robert Nofemela at NofemelaR@arc.agric.za

Mass importation of Natural Enemies

Overseas and locally there are quite a number of insectaries mass rearing natural enemies (mainly parasitoids and predators) for commercial purposes. These are exported to countries all over the world for biological control of agricultural pests. Because of the growing resistance to the use of pesticides they are especially valuable to farmers for the control of aphids, thrips, spider mites and whiteflies on flowers and vegetables in tunnels and glasshouses. Mass reared natural enemies are also widely used on crops such as cotton, corn, sugar-cane and fruit trees.

Since 1991 there were mass importations of the following natural enemies to South Africa:- *Encarsia formosa* for whiteflies, *Phytoseiulus persimilis* and *Amblyseius californicus* for spidermites, *Aphidoletes aphidimyza* and *Aphidius matricariae* for aphids, *Diglyphus isaea* and *Dacnusa sibirica* against the leafminer *Liriomyza trifolii*, *Amblyseius cucumeris* for thrips, the nematodes *Steinernema feltiae* and *Heterorrhabditis megidis* for the sciarid fly *Phyctinis callosus*. *Trichogramma pretiosum* against the African bollworm *Helicoverpa armigera*, *Ahytis melinus* for the citrus scale *Aonidiella aurantii* and the nematode *Deladenus siricidicola* against the woodwasp *Sirex noctilio.*

The Agricultural Act (Act no. 36 of 1983) is also applicable to these mass importations. The act stipulates that no living organism may be brought into the country without a valid permit. Permits are issued by the Directorate Plant Health. One of the conditions of the permit is that all imported natural enemies must be evaluated in an approved quarantine unit. The only insect quarantine in the country is the one of PPRI at Rietondale. For mass importations of natural enemies the following procedures must be followed: - First the importer applies for a permit of a trial consignment. This consists of one commercially packed sample of the organism. The sample is taken to quarantine where it is screened for any unwanted organisms, contaminants, diseases, pathogens or deformities. The identity is verified. The consignment is then destroyed. Once it is found that the culture is pure the importer can apply for a permit for future mass importations. These consignments go directly to the importer for releases. Control samples are taken regularly for identification and to check the quality. Importations are immediately stopped and the permit withdrawn if the standards are not met.

Insect Ecology Division (continued)

Mass importation of Natural Enemies (cont.)

These precautions have proven to be necessary and also of value to the importer as several cases were found where there were contaminants in cultures, or the wrong species was sent. For example, cultures imported for the control of the leaf miner contained, apart from the imported D*. isaea*, three other species, *D. websteri*, a *Meruana* sp. and a *Hemiptarsenus* sp. In another example the species sent was *Metaseiulus occidentalis* instead of *Amblyseius californicus.*

Leonie Pretorius

Pesticide Science Division

Top pesticide analytical chemist visits PPRI

Dr Markus Müller, the ex-Chairman of the Collaborative International Pesticides Analytical Council (CIPAC), heads the Department of Plant Protection Chemistry at Agroscope ACW Wädenswil (near Zurich Switzerland), and which falls under the Swiss Federal Office of Agriculture, visited PPRI from 7 -10 Nov 2007.

The aim was for Dr Müller to inspect and advise PPRI who is the lead organizer for the UN FAO/WHO Joint Meeting on Pesticide Specifications as well as for the CIPAC Meetings, all taking place in June 2007. He went with Dr Sandmann to inspect the Protea Hotel conference facilities at the Umhlanga Rocks village.

Dr Müller met with the CIPAC Organizing Committee (PPRI, SABS, National Laboratories Association, CropLife etc) to provide expert advice on the organization for the event.

It was time well spent, with Dr Müller concluding that PPRI and the Committee had done well so far with all the arrangements and that everything was on track for the June 2007 event.

Dr Eric Sandmann at SandmannE@arc.agric.za

The impact of Bt 11-maize on non-target beneficial arthropods

The impact of genetically modified crops on non-target beneficial insects has become a controversial topic worldwide. As part of their ongoing impact assessment and risk management strategy Syngenta South Africa (Pty) Ltd. contracted the Insect Ecology Unit to monitor the impact of Bt 11 maize on certain prevalent beneficial arthropods within maize fields under South African environmental conditions.

In a small-scale field trial surveys were undertaken over two maize growing seasons (2004/2005 and 2005/2006) at Delmas, Mpumalanga Province, South Africa. The numbers of certain beneficial flying insects caught on sticky traps and soil-dwelling arthropods caught in a network of pitfall traps in a Bt11 maize plot during the two growing seasons were compared with the numbers of those within standard insecticide-sprayed and unsprayed maize plots.

Petro Marais at MaraisP@arc.agric.za

Evaluation of the variability in the sensitivity of Helicoverpa armigera

The Insect Ecology Unit was contracted by Monsanto South Africa (Pty) Ltd. to determine the variability in the sensitivity of African bollworm (*Helicoverpa armigera*, Hübner) field populations to two purified endotoxin proteins.

Field populations were sampled at three localities, namely Settlers, Groblersdal and Vaalharts. Laboratory evaluations of these field populations, together with the susceptible PPRI laboratory population, to predetermined base-line concentration ranges of Bt-proteins, incorporated into an artificial diet, were done.

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Weeds Research Division

Potential new biological control agents for stinkbean

Australia is the native range of several alien weeds that are rapidly spreading in South Africa. One of these Australian weeds that is currently becoming more important is stinkbean (*Paraserianthes lophantha*), which is closely related to the invasive Australian *Acacia* species. *Paraserianthes lophantha*, commonly known as Cape Leeuwin Wattle or Crested Wattle in Australia, occurs naturally in the high rainfall south-western corner of Western Australia. In South Africa it is widespread throughout the wetter parts of the fynbos, as well as forest margins and riverbanks in the Western Cape, and is increasing in numbers.

A seed feeding weevil, *Melanterius servulus*, was released in 1989 against stinkbean to curtail its seed production and therefore its invasiveness. This is a vital part of a biological control programme against this weed, considering the high seed production by this plant, which can begin to produce seed after only two years of growth. Although well established, the weevil has been slow to spread and *P. lophantha* is continuing to spread and become more important as a weed in the western and southern Cape regions. There is therefore a need to release additional agents to compliment the impact of the weevil by destroying the vegetative parts of the plant.

In October 2006, Dr. Alan Wood and Judy Moore of the Weeds Division, Stellenbosch, flew to Western Australia to do a survey on *P. lophantha* and collect specimens of insect and pathogen species with the potential to be successful biological control agents.

Helpful staff at the Western Australian Herbarium in Perth provided locations of *P. lophantha* specimens collected throughout Western Australia over the last century. A two-week round trip was taken to survey *P. lophantha* from Perth, heading south past Bunbury, Margaret River, Augusta, Pemberton, Denmark, Albany and then up through the Porongurup and Stirling Ranges back to Perth. Several good sites of *P. lophantha* were discovered, mainly in riverine forested areas (particularly in Karri forest).

Various insects were founds associated with *P. lophantha,* such as small lepidopterans including a tip-miner and another that fed on the pods and seeds causing considerable damage; adult weevils of the family Belidae (*Rhinotia hemistictus*?); adult Coreid twig-wilting bugs; and scale insects. Many adult and larval longicorn borer beetles (Cerambycidae) were discovered boring and pupating beneath the bark of *P. lophantha* trees and causing excessive damage. However, the insects causing the most damage were very large lepidoteran larvae which, from the literature, are most likely to be in the family Hepialidae (*Aenetus* spp), known as swift moths, or Cossidae known as goat moths. Once sufficient numbers have emerged from collected material they will be submitted for identification at the Australian National Insect Collection in Canberra. Larvae of these moths bore into the trunks of trees, tunneling along the centre of the stems and causing the trunks to hollow out, weaken and eventually break due to the top-heavy branches and foliage.

Judy Moore collecting insects on stinkbean

The rust fungus *Uromycladium tepperianum* was found infesting *P. lophantha* at only one site, Boranup, where it was prolific.

Judy Moore at MooreJ@arc.agric.za or Alan Wood at WoodA@arc.agric.za

The rust fungus, *Uromycladium tepperianum*, on stinkbean in Australia

Population explosion of pompom weed in Gauteng

When the grassland invader, pompom weed (*Campuloclinium macrocephalum*) started producing its conspicuous pink-purple flowers in late November 2006, inhabitants of Gauteng were aghast at the vast increase in the distribution and density of the weed since the previous flowering season. It has also colonised several new areas in other provinces, including Kroonstad (Free State), Piet Retief (Mpumalanga) and several sites in the Waterberg (Limpopo) – see article on page 1. Predictions that this asteraceous weed from South America has the potential to invade and largely replace grasslands and wetlands in the major part of South Africa certainly do not seem exaggerated any longer. (Cont. p. 14)

Pompom weed replacing grassland near Magaliesburg

Weeds Research Division (continued)

Population explosion of pompom (cont.)

One of the reasons for pompom's success, as a weed, is that it invests considerable resources into its perennial underground structures (rootstock and tubers). The annual shoots and leaves visible in summer account for about 30% of the total biomass. It survives fires and frost during the winter months because all its living components are in a dormant state underground during that period. Under drought conditions in summer it can revert to a dormant state by withdrawing its nutrients from the shoots back into its roots. It has therefore evolved strategies to survive and multiply in grassland and savanna ecosystems in South Africa.

Pompom weed produces copious amounts of fluffy seeds, which are wind-dispersed. Other dispersal agents are vehicles and people carrying the seeds in the mud on their tyres and shoes respectively, and persons picking the flowers and later discarding the seeds.

Landowners should aim to maintain the natural vegetation in a healthy, productive state as this will help to limit pompom invasions. The only herbicide registered for use on pompom weed to date is Brush-Off by DuPont, of which 25g of granules should be mixed in 100 liters of water, or 2,5g per 10 liters. To minimize damage to desirable plants, the herbicide should be sprayed only onto the leaves of pompom weed, to the point at which they are shiny but not dripping. Do not spray in windy conditions, when temperatures exceed 28ºC, when there is dew on the leaves or when rain is likely within the next two hours. Spot-spraying in light pompom infestations should cause minimal damage to non-target plants. Annual follow-up spraying will be essential, since 20% of the weed population will survive as seeds in soil, missed plants or plants that recover because they did not receive enough spray.

Mr Jeremy Goodall from the Weeds Research Division of ARC-PPRI is testing more herbicides with the view of registration.

Physical methods of control such as uprooting or hoeing are only effective if the rootstock and tubers are removed and it is not advisable to plough lands with pompom weed as this will damage the rootstock, stimulating further vegetative growth and denser stands.

Spread of the plant can be limited by preventing seed production. Aerial stems can be cut right back before the flowers produce seed. However, be warned that the plants will be stimulated to produce more stems and in order for this method to work the plants will have to be cut back several times until the end of the growing season. Repeated cutting back of aerial growth should deplete nutrients stored in the roots, weaken the plant and limit seed production in the following season. This method is only practical on a small scale and it is advisable to remove all cut stems from the site, being careful not to spread the weed further, and to dispose of all flowers by burning of freezing.

The Weeds Research Division is involved in research into the biological control of pompom weed, with Dr Andrew McConnachie of the Cedara weeds laboratory as project leader. Three very promising insect species and a fungal pathogen are being studied in quarantine as potential biocontrol agents. It will unfortunately take another few years before any of these agents can be released in South Africa. (But read the following report.)

Most of the information was taken from a leaflet prepared by Lesley Henderson, Jeremy M Goodall & Hildegard Klein, which can be downloaded from the internet at http://www.arc.agric.za/home.asp?PID=1041&ToolID=63&ItemID=2959.

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The seed-feeding pterophorid moth, *Adaina* sp., one of the biocontrol candidates in quarantine

Locally discovered rust fungus to curb pompom weed?

In the summer of 2006, during spray trials on pompom weed (*Campuloclinium macrocephalum*) near Swartkops, south of Pretoria, it became evident to researcher Jeremy Goodall of PPRI that many *unsprayed* plants were sickly and even dying back. Much to the surprise of biocontrol workers, it turned out that there was a rust fungus on the leaves and stems. Upon examination by Dr Alan Wood, a PPRI rust fungus specialist, it was found that this fungus was clearly related to, but not the same as either of the two *Puccinia* species known from *C. macrocephalum* from South America. (One of them is being studied in the PPRI quarantine facility at Stellenbosch by Estianne Retief). A survey in the Pretoria area revealed a few less severe occurrences of the fungus, especially near the N1 Highway east of Pretoria.

The intensity of leaf and stem infections increased during the particularly wet first months of 2006. After the winter plants infested by the fungus were not seen again until late December 2006. Levels of infestation increased in the ensuing months, and good rains in January 2007 presumably encouraged further infestation of plants. Plants in some of the originally infested sites are now turning yellow and have most leaves and stems infested, and are likely to turn brown within a few weeks.

Pompom plants in the field east of Pretoria becoming yellow after spontaneous infection by *Puccinia* sp.

Rust fungus of pompom (cont.)

The first visible symptoms of infestation with the rust fungus are usually a yellowing of leaves near the ground, and then small brown pustules (protruding lesions), often surrounded by a small pale area. Lesions (and yellowing) seem to appear first on the lower leaves, and then on smaller leaves nearer the flower heads (see photo below). Brown spots or sori, with spores exuding, later also develop on stems. If conditions for infections are good, most or all leaves soon turn yellow and then die, shrivel and drop. The above-ground parts of pompom weed characteristically die off during winter, and the fungus would have to survive the winter months in the form of teliospores, which are more resistant than the spores produced in masses during the summer months.

Close-up of leaves with brown sori, bearing masses of spores

Puccinia spp. and other rust fungi are notoriously host-specific, and pose no threat to plants other than their host plants, or even strains of their host. The *Puccinia* discovered on pompom here is microcyclic, which means that, unlike some rusts, it does not require a second host in its cycle: it completes its different stages on the same plant.

Experiments to infest healthy plants by dropping infested stems amongst them seem to have promise to spread the fungus, and experiments are being conducted to apply this fungus in an inundative way, as a mycoherbicide, *as early as possible in the growing season,* to achieve maximum impact on the plants.

It is not known how widespread the fungus may be, and whether there are foci other than the known ones where the fungus may not have been spotted. It is absent from some infestations further away from Swartkops. A survey now needs to be done to monitor spread, intensities, and its effect, also in relation to stage of infection and weather conditions.

The use of a another *Puccinia* species in the USA against the invasive weed “dyers’ woad” (*Isatis tinctoria,* not known as invasive in South Africa) seems to offer a very efficient, environmentally-friendly way of controlling that weed, with no risks to related wild mustards there.

Dr Stefan Neser at NeserS@arc.agric.za or Estianne Retief at RetiefE@arc.agric.za.

Any reports of the presence of symptoms, if possible with a close-up image, or sample of an infected leaf, would be appreciated. Such records should be e-mailed to Dr Stefan Neser at NeserS@arc.agric.za and/or Estianne Retief at RetiefE@arc.agric.za.

Rietondale Campus in Pretoria