



Tree Protection News



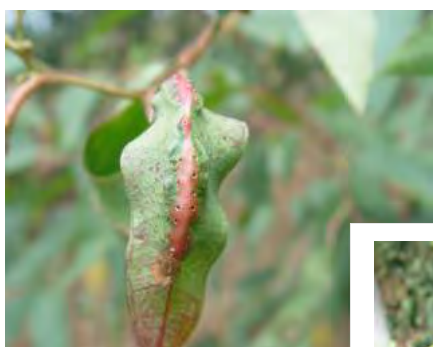
Newsletter of the Tree Protection Co-operative Programme and the DST/NRF Centre of Excellence in Tree Health Biotechnology.

VOL: 17

June 2009

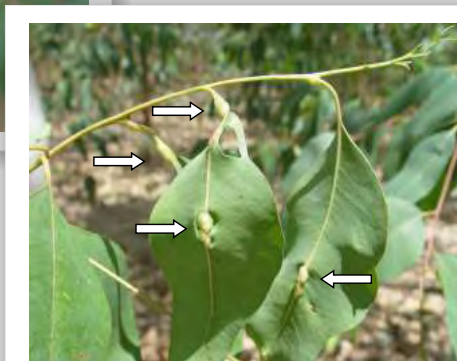
FROM THE DIRECTOR'S DESK

This last week, we sent out on TreeHealthNet a remarkable newspaper story of a man in Russia that had a pine seedling germinate in one of his lungs. This seemed to unreal to be true, yet an interesting angle on TREE DISEASE. The next day, some South African researchers came back with reasons why this was almost certainly a hoax. That plants could not germinate inside the body and that the x-ray plate was not genuine. One has to marvel at how easily those of us that are scientists fall into believing the unbelievable. Also how newspapers so easily publish outlandish stories. And there is a deep message that pertains very strongly to the business of the Tree Protection Co-operative Programme (TPCP) and the Centre of Excellence in Tree Health Biotechnology (CTHB). Let me tell you more.....



Symptoms caused by the Eucalyptus gall wasp from Australia, *Leptocybe invasa*, which was recently reported from South Africa and which is currently spreading through the country.

Arrows indicate fresh galls on the leaf midrib and petioles.



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A few weeks back, I participated in the IUFRO International Forest Bio-Security held in Rotorua, New Zealand. A core focus of the meeting, other than the threat of pests, pathogens and weeds to forests and forestry, was on communication between Science and Policy in issues pertaining to Forest Bio-Security. The upshot here is that Policy Makers (Managers too) have difficulties dealing with Scientists. The former group needs quick answers to urgent questions. The latter group has a very strong dependence on the accuracy of the answers provided. One of the participants from the policy side made the tongue in cheek (I hope) comment that scientists have an undue focus on peer reviewed papers. This certainly illustrates a widely held view that also represents a sad misinterpretation of the truth. There is a key reason why scientists publish papers and why this is underpinned by peer review. And that reason has to do with ensuring accuracy and dependability of the answers given. AND it is the reason why one can find articles in newspapers such as the one I mentioned earlier.



The TPCP has three main focus areas and we pride ourselves in maintaining a careful balance between these.

They include: **Research** - This includes both short and long term investigations conducted on core pathogen and pest problems to South African Forestry. **Extension** - Here activities include participation in field days, provision of a state of the art pest and disease clinic and field visits to follow up on new problems, often emerging from clinic samples; and **Education**. This element of the group's activities has various components. The fact that the TPCP is based at a University means that students (M.Sc., Ph.D. and Post Doctoral) make up a key component of the team. Their work needs to be acceptable for degree purposes, yet also relevant to the objectives of the programme. Further to this, team members provide classes at Saasveld, the University of Natal, Stellenbosch University and training courses are also held. What is important in terms of research is that we concentrate strongly on quality and this is achieved by challenging ourselves to meet the highest possible levels of peer review. I remain convinced that this is one of the reasons why the TPCP has gained the high level of international recognition that we enjoy and that we benefit from.

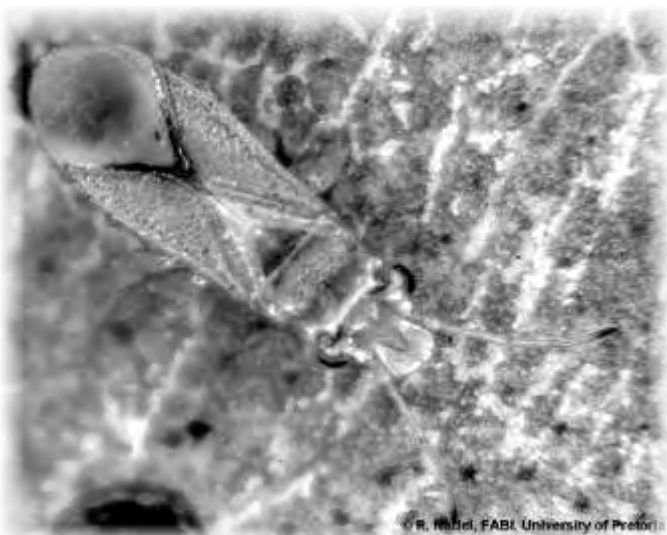


In producing the introduction to our first issue of Tree Protection News, I cannot fail to make some comments on the global economic crisis that we face. Some readers will know that I was at Harvard Business School at the time that the problem really took hold.

One could not have wished to be in a better place to witness the panic at first hand and to hear endless debates from the world's great economists on the basis (solutions) to the crisis. I certainly learned a great deal regarding the importance of "cash flow" and the voice of Prof Bill Fruhan "don't run out of cash" continues to ring shrill in my ears. Clearly, South Africa and South African Forestry will be touched severely by the economic crisis and this is already having an effect on small support programmes such as the TPCP. From my own perspective, I hope that we are able to maintain our research and development momentum, while forging through the troubled waters. As I told young Graduandi at a graduation speech last week, many of the winning companies of the last 50 years are those that were able to invest in research and development during the great depression of the late 1930's. I hope that this is something that South African companies will also be saying in years to come when we look back on this financially difficult period.



A word of caution though..... in the case of pests and diseases, the challenge is to keep one step ahead of the enemy. I have no doubt that to relax our efforts will be at our own peril.



In terms of tree health issues, we face many new and interesting challenges this year. Certainly, we are strongly encouraged by the improvement in the efficacy of the nematode inoculations used for Sirex biological control. It is perhaps early days to be able to open the champagne corks, but there seems to be light at the end of the tunnel.



As is the case with Sirex, we continue to make solid progress in dealing with the Eucalyptus gall wasp, the bronze bug infestation and pitch canker. But all are long term projects and the problems will be with us for the foreseeable future. We are leading the charge on these problems in a world-wide sense. This will surely earn us many advantages.

The annual meeting of the TPCP is just around the corner. Sadly, the difficult economic times will mean that attendance will not be equal to that in the past. Yet we have managed to secure visits from a good number of important scientists. These include Prof. Zvi Mendel that has pioneered biological control of *Leptocybe* and Prof. Richard Hamelin who is a world leader in developing techniques to understand the global movement of forest pests and pathogens.



We look forward to seeing you on field trips, at meetings or when you have a chance to pass by FABI for a more casual visit. Our quest to KEEP TREES HEALTHY is a matrix team effort and we depend on your participation to reach this important goal.



TPCP/CTHB Diagnostic Clinic 2008

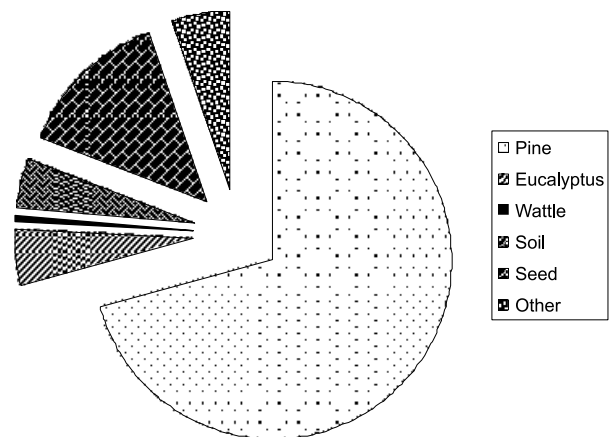
The TPCP/CTHB Diagnostic Clinic provides a diagnostic service for members, identifying pests and pathogens, and where possible provide advice and/or suggestions on controlling or preventing attack/infection. This is a free service, available to all member companies of the TPCP/CTHB Programmes. The Clinic also functions as a surveillance tool, not only monitoring the occurrence and spread of known pests and pathogens, but playing a crucial role in the detection of newly arrived pests and pathogens.

Fusarium circinatum is still the most important pathogen in terms of the clinic as the majority of samples received in 2008 were related to detection of this pathogen. An increase in stress associated pests and pathogens were also noted, which could be attributed to various environmental disturbances such as fire, drought and extreme temperatures, alluding to the effect that climate change could have.

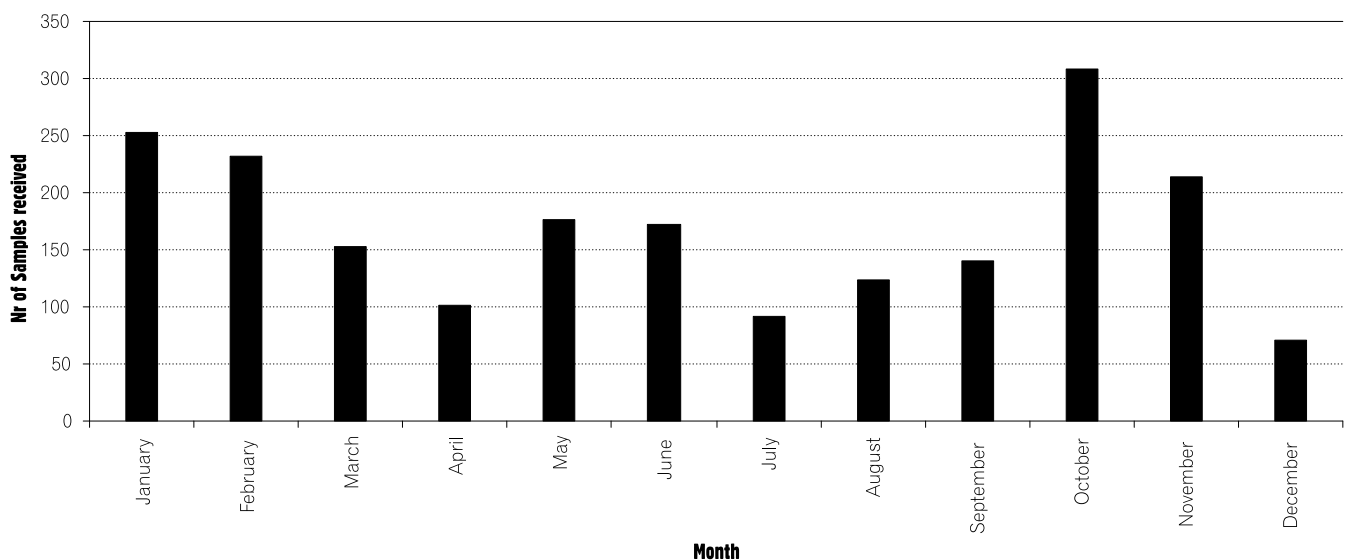
The clinic received a total number of 2036 samples from January until December 2008. Pine samples comprised 71 % of the total number of samples received, with the majority of these samples received for *Fusarium* screening of both nursery and mature field samples.

Eucalyptus samples made up 5 % of the total number of samples. Wattle samples only comprised 0.4 % of the total amount of samples. Soil samples comprised 4.4 % of all samples received. Seed samples, received for *Fusarium* screening comprised 14 % of samples received, an increase of approximately 10% from last year. Samples from non-forestry and indigenous trees, as well as water and Petri dish samples, are categorized under "other" and these comprised 5 % of received samples.

Distribution of samples received from January to December 2008



Total number of samples received from January - December 2008



TPCP/CTHB Diagnostic Clinic Activities 2009

The diagnostic clinic relies on post-graduate students to assist Izette Greyling, the manager of the clinic. In this sense it also fulfils an important student training role. New student members join the clinic every year to gain experience working with various pests and pathogens.



Front Left: Michael Mbenoun
a new PhD student from Cameroon
Back Left: Darryl Herron
a MSc student from South Africa
Back right: Johan van der Linde
a MSc also from South Africa
Middel right: Shuaifei Chen
a PhD student from China
Front right: Bernice Porter
a MSc student who will be doing
the *Fusarium circinatum*
identification PCR's
a new PhD student from Cameroon



Diagnostic Members Hard At Work

Part of the training for the students is a field trip to various forestry regions in South Africa to show them pests and pathogens in field and also to expose them to forestry operations in South Africa. In February 2009 the clinic undertook a week long field visit to forestry companies in the North Eastern Cape, KwaZulu-Natal and Mpumalanga Provinces. Clinic members were shown the impact of Pitch canker on mature *Pinus greggii* (Northern provenance), *Pissodes nemorensis*, Blue stain (*Diplodia pinea*), bacterial blight infections, *Gonipterus scutellates* infestations, wattle bag worm, Phytophthora root rot of Eucalypts, Kirramyces stem canker (Coniothyrium stem canker on Eucalypts), cossid moth (*Coryphodema tristis*) and fresh infestations of *Sirex noctilio*. Their visit also included nurseries and the "drum farm" to see the *Sirex* emergence chambers at Mondi Shanduka Newsprint's Lynwood Estate and a visit to an old Eucalypt clonal trial near Kwambonambi where clones had been inoculated with *Chrysosporthe austroafricana* to select tolerant genotypes.

We would like to thank Julian Moreno and Theo van Zyl (PG Bison), Rob Perry and Konrad Buchler (Sappi Richmond), Criag Norris (NCT), Mark Holmes and Rhudolf Muller (Mondi) and Fanie du Toit (Sappi), for their hospitality and for taking the time in showing us the various nurseries operations and field situations.

Field Extension

Field extension is an important component of the TPCP/CTHB programme. In 2008 our field extension capacity was increased with the FSA funded Forest Entomology Extension position. Izette Greyling was appointed in this position and activities so far included various field trips to investigate problems experienced by member companies, presentations at ICFR and industry field and awareness days as well monitoring activities.

Field trips in 2008 totalled 47. The team spend nearly 600 person days in the plantations and forests of South Africa, with one trip to Zambia to investigate possible future threats from further north on the continent.



Jolanda Roux and Donald Chungu discussing the health of Eucalypts in a newly established plantation in Zambia.



TPCP members interacting with a mensuration team in Sabie. The day was organized by the company to update the mensuration team on pests and diseases in the area.

Finally, we would like to ask that you contact Izette Greyling (izette.greyling@fab.up.ac.za) or Jolanda Roux (jolanda.roux@fab.up.ac.za) if you have any questions regarding possible diseases or if you would like to send samples to the clinic. This would enable us to offer advice on what samples to send as well as the best way to package and send the samples. We would also be able to discuss the problem in more detail and determine if a site visit is necessary. Please also join our online tree health forum, Treehealthnet, for regular updates on pests and diseases, fieldtrip advertisements and other issues related to tree health.

WELCOME TO THE TPCP AND CTHB TEAMS



Michael Mbenoum joined the CTHB for his PhD and will be working on Ophiostomatoid fungi, particularly *Ceratocystis* spp. on native trees on the African continent. These fungi are important tree pathogens, but still understudied in Africa. Michael is from Cameroon where he previously worked for IRAD on diseases of cacao. He has a M.Sc in Biochemistry from the University of Yaoundé.

Johan van der Linde joined the CTHB and will be doing his masters research on the decline and death of native *Euphorbia ingens* trees (naboom/candelabra trees) in the Limpopo Province. Johan holds a B.Sc honours degree from the University of Pretoria and worked on the Botryosphaeriaceae on *Acacia mearnsii* for his honours degree



Dr. Eensung Ho, from South Korea, joined the TPCP programme as a post-doctoral researcher. She obtained her PhD in the USA, working on *Phytophthora* spp. These organisms will also be the focus of here research while in South Africa.

Tuan Duong is from Vietnam and will be doing his PhD on the population diversity and mating genes of *Grosmannia* species. He obtained his B.Sc (in Microbiology) and M.Sc (in Biology) from the Hanoi University of Science in Vietnam. He also has experience working as a full-time researcher in the microbiology department of Food Industries Research Institute, Vietnam.



Gudrun Dittrich-Schröder completed a BSc (Agriculture), with a focus on Entomology and Genetics, at the University of KwaZulu-Natal, Pietermaritzburg. She has conducted research in collaboration with the South African Sugarcane Research Institute (SASRI), Mount Edgecombe, Durban on Scarabaeids as well as a potential biocontrol agent of the stalk borer, *Eldana saccharina*. Gudrun's MSc (Molecular Diagnostics and Phylogenetics of White Grubs in Sugarcane) focused on identifying Scarabaeid larvae problematic in sugarcane by using molecular techniques to link unidentified larvae to identified beetles. Subsequently a field key and electronic key, using Lucid 3.4 software, were developed to allow identification of larvae in sugarcane fields. Gudrun has recently commenced her PhD in the TPCP programme. Her study will focus on the Eulophid, *Leptocybe invasa*, which has been recorded from *Eucalyptus* spp. in South Africa in 2007 and is spreading rapidly.

Eric Birkholz completed his BSc honours at the University of Pretoria, working on the bacterial pathogen *Pantoea ananatis*. Eric will be continuing in the TPCP, working on the microbial community diversity that occurs in the *Sirex noctilio* woodwasp.



Darryl Herron, a University of Pretoria graduate, will be conducting research on *Fusarium circinatum* for his MSc degree.

Xintao Mou, from China, joined FABI to conduct research on *Calonectria* spp. (Cylindrocladium) for his Phd degree. Xintao is also affiliated to the China Eucalyptus Research Centre (CERC) in China and one of the people helping to build stronger bridges between China and South Africa.



CONGRATULATIONS

We congratulate the following people who recently obtained their degrees. We wish you all the best in your future endeavours!

PhD

- **Carrie Brady** Taxonomic evaluation of the genus *Pantoea* based on a multigene approach.
- **Juanita de Wet** Molecular studies on the taxonomy, host-associations and viruses of the Diplodia-like anamorphs of the Botryosphaeriaceae.
- **Ronald N. Heath** *Ceratocystis* species in southern and eastern Africa with particular reference to *Ceratocystis albifundus*.

Msc

- **Francois van der Walt** Botryosphaeriaceae associated with native *Acacia* species in Southern Africa with special reference to *Acacia mellifera*.
- **Mamodise Happy-girl Malema** Characterization of latent Botryosphaeriaceae on diverse *Eucalyptus* species.

Bsc honours

- **Eric Birkholz** with a project on *Pantoea ananatis*.
- **Darryl Herron** with a project on *Fusarium circinatum*.
- **Gabriel de Ridder** with a project on *Ceratocystis albifundus*.
- **Johan van der Linde** with a project on Botryosphaeriaceae on *Acacia mearnsii*.
- **Angela Shumba** with a project on *Sirex noctilio*.

CLIMATE CHANGE AND FORESTRY

New Study Warns Damage to Forests from Climate Change Could Cost the Planet Its Major Keeper of Greenhouse Gases

At UN Forum on Forests, Scientists Release Analysis Showing Forests At Risk of Becoming Net Sources of Carbon Instead of Net Sinks

New York (17 April 2009) –The critical role of forests as massive “sinks” for absorbing greenhouse gases is “at risk of being lost entirely” to climate change-induced environmental stresses that threaten to damage and even decimate forests worldwide, according to a new report released today. The report will be formally presented at the next session of the United Nations Forum on Forests (UNFF) taking place 20 April-1 May 2009 at the UN Headquarters in New York City.

“Adaptation of Forests and People to Climate Change – A Global Assessment” was coordinated by the Vienna-based International Union of Forest Research Organizations (IUFRO) through the Collaborative Partnership on Forests (CPF), an alliance of 14 international organizations that each has substantial forestry programs. Authored by 35 of the world's top forestry scientists, it provides the first global assessment to date of the ability of forests to adapt to climate change and is expected to play a key role in next week's UNFF discussions. The report presents the state of scientific knowledge regarding the current and projected future impacts of climate change on forests and people along with options for adaptation.

Continue 

“We normally think of forests as putting the brakes on global warming, but in fact over the next few decades, damage induced by climate change could cause forests to release huge quantities of carbon and create a situation in which they do more to accelerate warming than to slow it down,” said Risto Seppälä, a professor at the Finnish Forest Research Institute (Metla) and Immediate Past President of IUFRO, who chaired the expert panel that produced the report. Scientists hope the new assessment will inform international climate change negotiations, set to resume in December in Copenhagen, where forest-related deliberations thus far have focused mainly on carbon emissions from deforestation. The analysis shows that officials also must consider how the world's forests are likely to suffer—and perhaps severely—as the earth gets warmer.



While deforestation is responsible for about 20 percent of greenhouse gases, overall, forests currently absorb more carbon than they emit. The trees and soils of the world's forests are capturing and storing more than a quarter of the world's carbon emissions. The problem, scientists say, is that this critical carbon-regulating service could be lost entirely if the earth heats up 2.5 degrees Celsius (4.5 degrees Fahrenheit) or more relative to pre-industrial levels, which is expected to occur if emissions are not substantially reduced. The study notes that the higher temperatures—along with the prolonged droughts, more intense pest invasions, and other environmental stresses that could accompany climate change—would lead to considerable forest destruction and degradation. This could create a dangerous feedback loop in which damage to forests from climate change significantly increases global carbon emissions which then exacerbate the greenhouse effect.

The warning from scientists that forests are in danger of flipping from a net sink to a net source of carbon emerged from an exhaustive analysis of how different forest ecosystems worldwide would be affected under specific climate change scenarios developed by the Nobel-prize winning UN Intergovernmental Panel on Climate Change (IPCC). The authors of the report, some of whom also serve on the IPCC panel, noted that the impacts in different ecosystems would vary over time. In fact, the authors found that the risk of losing forests as a net carbon sink is significant even in relatively conservative scenarios in which countries achieve modest emissions reductions and stabilize greenhouse gas concentrations. The loss becomes much more likely in scenarios where curbs fail to take effect and emissions continue on their current, upward trend.

“Policymakers should focus greater attention on helping forests and the people who live around them adapt to anticipated problems,” said Professor Seppälä. “For example, wider application of well-understood sustainable forestry practices, which offer a range of benefits, could help forests avoid some of the damage induced by climate change.”





Threats, But also Benefits, of Climate Change

The study observes that as climate change progresses over the next decades:

- Droughts are projected to become more intense and frequent in subtropical and southern temperate forests, especially in the western United States, northern China, southern Europe and the Mediterranean, subtropical Africa, Central America and Australia. “These droughts will also increase the prevalence of fire and predispose large areas of forest to pests and pathogens,” the study says.
- In some arid and semi-arid environments, such as the interior of the American west, forestry experts worry that climate change could be so dramatic that timber productivity could “decline to the extent that forests are no longer viable.”
- Decreased rainfall and more severe droughts are expected to be particularly stressful for forest-dependent people in Africa who look to forests for food, clean water and other basic needs. For them, the scientists predict climate change could mean “deepening poverty, deteriorating public health, and social conflict.”
- In certain areas, climate change could lead to substantial gains in the supply of timber. The combination of warming temperatures and the fertilizing effect of increased carbon in the atmosphere could fuel a northward expansion of what is known as the boreal forest, the coniferous timber lands that run across the earth's northern latitudes and include forests in Canada, Finland, Russia and Sweden. Research from the report indicates that climate change could cause more than a 40 percent increase in timber growth in Finland. In fact, the study concludes that the increased growth in boreal forests could be large enough to spur a drop in timber prices worldwide. However, over the long-term, if climate change continues at the current pace the boreal expansion eventually will be offset by an increase in insect invasions, fires, and storms.

The scientists warn that efforts to adapt to climate change may end up providing forests with only a temporary respite. “Even if adaptation measures are fully implemented, unmitigated climate change would, during the course of the current century, exceed the adaptive capacity of many forests,” said Professor Andreas Fischlin of the Swiss Federal Institute of Technology, who is one of the lead authors of the study and a coordinating lead author with the IPCC. “The fact remains that the only way to ensure that forests do not suffer unprecedented harm is to achieve large reductions in greenhouse gas emissions.”

Forestry experts acknowledge that more research is needed to better understand precisely how climate change will impact forests and how effective different adaptation responses will be. But they say the challenge to policy makers is that they must act even in the face of imperfect data because “climate change is progressing too quickly to postpone action.”

About IUFRO and the CPF

The International Union of Forest Research Organizations (IUFRO) is the only world-wide organization devoted to forest research and related sciences. Its members are research institutions, universities, and individual scientists as well as decision-making authorities and other stakeholders with a focus on forests and trees. For further information, please visit: www.iufro.org.

The Collaborative Partnership on Forests (CPF) is a voluntary arrangement among 14 international organizations and secretariats with substantial programmes on forests. Its mission is to promote the management, conservation and sustainable development of all types of forest and strengthen long-term political commitment to this end. For further information, please visit: <http://www.fao.org/forestry/cpf/en/>.

Eucalyptus Gall Wasp Training Course in Israel

TPCP and CTHB scientists rewarded for outstanding science

The Eucalyptus gall wasps, *Leptocybe invasa* and *Ophelimus maskelli* are small wasps of about 1mm in length, which cause galls on the leaves and stems of *Eucalyptus* trees. These wasps originate from Australia, but have been accidentally introduced to many Eucalyptus growing countries where they pose a serious pest threat. *Leptocybe invasa* was detected in South Africa in 2007, while *Ophelimus maskelli* has not yet been detected in South Africa, but is likely to arrive in the near future. The galls formed by these minute wasps cause malformation and/or reduced growth.

In response to the global concern around this wasp, a course was held recently, 10-18 November 2008, in Jerusalem, Israel. Israel was one of the first countries where these gall wasps were detected, and Israeli scientist Dr Zvi Mendel promptly led a project to find natural enemies in Australia, that would be suitable as biological control agents. This resulted in the detection and identification of various parasitic wasp species, some of which have subsequently been successfully reared and released in Israel.

to their countries, for subsequent rearing and release (providing permits were obtained). The TPCP obtained an import permit, so we were able to bring the biological control agents back to South Africa, where we are currently rearing them for release in the field, and working towards obtaining a release permit. The release of these biological control agents is a crucial step to combat the very serious threat that the Eucalyptus gall wasps pose to forestry in South Africa.

In addition to the focus on the gall wasps and their biological control agents, the attendees of the course were also exposed to some of the incredible work that Israel is doing in agriculture and afforestation. Unlike South Africa, most of the forests are planted to counter desertification and for recreational purposes (green areas for the public to enjoy), rather than for commercial use. Some of the forests are planted in areas where rainfall is less than 200 mm per annum, using ingenious methods to supply sufficient water and nutrients. The course was a huge success with attendees from South Africa, Uganda, Kenya, Thailand, Italy, Turkey, China, Brazil, India and Australia. From South Africa, Gudrun Dittrich-Schroder and Brett Hurley attended from the TPCP, and Marcel Verleur from Sappi. A special thanks to Dr Zvi Mendel and the various staff of JNF (Jewish National Fund) who organized and funded this course.



Gudrun looking at a biological control agent through the microscope.

The course focused on the gall wasps and their biological control agents, which included their identification and rearing. In addition to sharing this valuable information with the attendees, the organizers also offered the attendees the opportunity to take the biological control agents



Damage to *Eucalyptus* sp. caused by *Ophelimus maskelli*

Who's Who in the TPCP?

Elsie Cruywagen



PhD student
Nationality: South African

Research / Expertise:

My studies for my PhD focus on the fungi occurring on baobab (*Adansonia*) trees in Africa and Madagascar. There is very little information available on the micro-organisms that occur on these remarkable trees. There are eight species of baobab trees in the world, one is native to Africa (*Adansonia digitata*), one occurs in Australia and the other six are native to Madagascar. We have received many reports of baobab trees dying in southern Africa in the last two decades. My aim is to determine whether these deaths are due to disease, drought or other factors. I will also be investigating the fungi that occur as endophytes on the trees and comparing what I find in Africa with what is present in Madagascar.

Hobbies / Interests:

I love reading and enjoy mostly novels especially Fantasy and Science Fiction. I also love the outdoors and like to go hiking whenever I get the chance.

Lydia Twala



Lab Technician
Nationality: South African

Research / Expertise:

I am a team member of the Culture Collection service of the TPCP. The Culture Collection houses all the fungal cultures that staff and students of the TPCP have worked with, collected from South Africa and across the globe, and is crucial for the research of the TPCP. My primary focus is the general preparation of different mediums and transferring of fungal cultures on a daily basis. I am also responsible for maintaining the quality and quantity of fungal cultures in our collection, which is currently over 3200 different isolates. This responsibility includes assisting students who need to obtain cultures for their research and providing them with the correct information regarding these cultures. Apart from culture collection maintenance, I ensure that the Preparation Laboratory - essential for the functioning of FABI - is kept in good condition.

Hobbies / Interests:

I enjoy working with beads, dress making and singing (especially in the choir). My other passions include bible study and cooking.

SASPP Congress 2009

In January of this year, staff and students representing the TPCP and CTHB attended the 46th Congress of the Southern African Society of Plant Pathology (SASPP) held at the Villa Via Hotel in Gordons Bay. The congress also hosted the 6th meeting of the African Mycological Association concurrently with the SASPP congress. These meetings allowed both staff and students from institutions around South Africa and Africa to present their work to the plant pathology community as well as giving all the opportunity to develop their projects and professional ties with other organisations.

In total 42 staff and students members of the TPCP/CTHB research programmes attended the meetings, presenting 22 oral papers and 14 poster presentations. The presentations given by members of the TPCP and CTHB programmes, ranged in topic from the development of new techniques such as microsatellite discovery to the range and diversity of pathogens of various tree species in South Africa and the African continent.

A general emphasis was placed on disease detection, management and control at the congress. These important ideas were reinforced by talks from invited international guests to the conference, giving everyone insight into how other institutions deal with plant diseases.

Members of the TPCP and CTHB can be proud of the quality of work presented at the two congresses. Irene Barnes a PhD student of FABI, won the best student presentation of the congress for her talk entitled “Global population structure and diversity of the red band needle blight pathogen, *Dothistroma septosporum*, reflects anthropogenic activity”. Special mention must also be made of Pieter De Maayer, whose talk was nominated as one of the top 5 student presentations at the conference. His talk was entitled “The genome sequence of *Pantoea ananatis*: towards understanding bacterial blight and dieback of *Eucalyptus*”.

The congress hosted the annual general meeting of the African Mycological Association which was well attended by the TPCP/CTHB group. We are proud to announce that Dr Marieka Gryzenhout, a UP post-doctoral fellow at FABI, was elected as the new chairperson and Prof Jolanda Roux as the secretary of the Association.

The SASPP Congress was enjoyed by all who attended. The days were filled with interesting and thought-provoking ideas and presentations and the dinners and camaraderie in the evening were most welcome. The congress was a great success, giving everyone who the chance to air their thoughts and ideas.



Some members of the TPCP/CTHB who enjoyed the beautiful facilities provided for the congress attendees.

Continue



SELECTED ABSTRACTS FROM CONGRESSES

Results of a disease investigation of *Aloe dichotoma* in Goegap Nature Reserve, South Africa

J Roux, G van Rooyen and N Uys

Over the last few years numerous reports of large scale death of *Aloe dichotoma* (quiver tree) trees have been made. Although a number of studies blame the mortality on climate change and an apparent range shift, numerous reports mention the occurrence of fungal diseases on these trees. None of these reports, however, name the causal agents of the fungal diseases. During May 2008 three 100 m x 100 m plots on the Goegap Nature Reserve in the Northern Cape Province were investigated for the presence of fungal disease on *A. dichotoma* trees. All trees in the plots were evaluated for disease and insect pests, measured and photographed. Although lichen growth was abundant on the stems and branches of trees in some sites, no fungal disease of the more than 300 trees evaluated was observed. The most common problem identified on the trees were infestation by scale insects on the leaves of trees, damage to the trees by various animals such as baboons and gemsbuck and in one site weevil infestation. A brief visit was also made to the quiver tree forest near Kenhardt where the same situation was observed, with the main problem being that of scale infestation and uprooting of trees. Young plants, ranging in size from ~30 stem circumference to mature trees, were observed in all areas visited. Further studies, of sites specifically mentioned in previous reports, are necessary to confirm the possibly role of fungal disease on the decline of natural populations of *A. dichotoma* trees.



A multi-gene phylogeny of the wilt pathogen *Ceratocystis albifundus* from different hosts and geographic regions

G. A. de Ridder, J. Mehl, G. Kamgan Nkuekam, E. Steenkamp & J. Roux

Ceratocystis albifundus is an important fungal pathogen of non-native *Acacia mearnsii* trees in Eastern and Southern Africa. Infection of *A. mearnsii* by *C. albifundus* results in the rapid wilt and death of susceptible trees and canker formation on more tolerant trees. *C. albifundus* has been reported on numerous native South African host tree species and isolates of the fungus from Uganda and South Africa were found to have a high genetic diversity leading to the hypothesis that *C. albifundus* is native to the African continent. *C. albifundus* isolates obtained from native South African host trees typically form a number of sub-clades in ITS (ribosomal RNA internal transcribed spacer) phylogenies. The aim of this study was to determine whether these sub-clades potentially represent

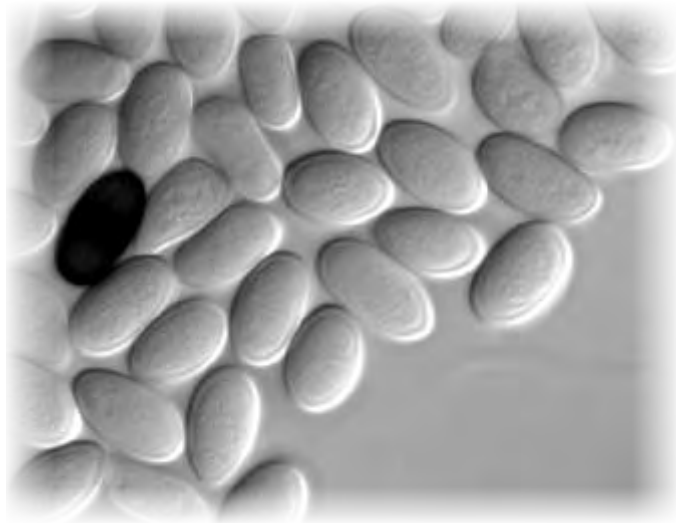




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cryptic species similar to the situation in *C. fimbriata*, a species closely related to *C. albifundus*. For this purpose a multiple gene phylogenetic study was undertaken using ITS, α -tubulin and translation elongation factor-1 α gene sequences. A broad collection of isolates were obtained from native and introduced tree species in Kenya, South Africa, Tanzania, Uganda, Zambia and Chile. Results indicated that divergence within *C. albifundus* does exist but that it is not substantial enough for the description of new species.

These results, therefore, confirm that *C. albifundus* has a wide geographic distribution on the African continent. Furthermore, the fact that this taxon frequently occurs on introduced tree species suggests a great capacity for host jumps, including to introduced tree species such as the Australian *Acacia* and some *Eucalyptus* spp. Because of its virulence on Australian *Acacia* spp., *C. albifundus* should be considered an important quarantine threat to Australia and other countries with related tree species.

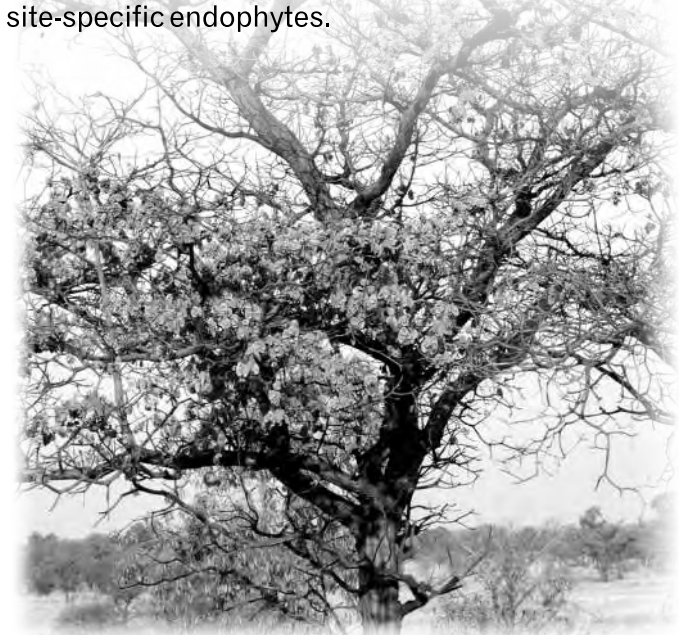


Botryosphaeriaceae associated with *Terminalia catappa* in three African countries: South Africa, Madagascar, Cameroon

B.A.D. Begoude, J. Roux, B. Slippers, and M.J. Wingfield

Species of Botryosphaeriaceae represent some of the most important pathogens of woody plants. Although members of the Botryosphaeriaceae are relatively well studied on economically important

crops, hardly anything is known regarding these fungi on native or non-commercial tree species. The aim of this study was to compare the diversity and distribution of the Botryosphaeriaceae on *Terminalia catappa*, a tropical tree of Asian origin planted as ornamental in Cameroon, Madagascar and South Africa. A total of 83 trees were sampled, yielding 79 isolates of the Botryosphaeriaceae. Isolates were grouped based on culture and conidial morphology. Representatives of the different morphological groups were further identified using a combination of morphological characteristics and sequence data for the ITS and EF 1- α gene regions. Five species of Botryosphaeriaceae were recorded, including *Neofusicoccum parvum*, an unknown *Neofusicoccum ribis*, *Lasiodiplodia pseudotheobromae*, *L. theobromae* and an unknown *Lasiodiplodia* sp. *Lasiodiplodia pseudotheobromae* and *L. theobromae*, the most commonly isolated species (62%), were found at all the sites. These two species are generalists that are also frequently found on numerous other plant hosts. *Neofusicoccum parvum* was found only in South Africa, whereas the unknown *Neofusicoccum ribis* and the unknown *Lasiodiplodia* sp. were found only in Cameroon and Madagascar, respectively. Further sampling is needed to determine the host range and distribution of the newly recorded species and to understand whether they are occasional colonists or site-specific endophytes.





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Fungi from *Adansonia* spp. (Baobabs) in Africa and Madagascar

E. M. de Meyer, J. Roux, B. Slippers, B. D. Wingfield, M. J. Wingfield

The African baobab tree (*Adansonia digitata*) is an iconic tree that forms an integral part of the African landscape. This is one of eight species of *Adansonia* that is known worldwide. Madagascar is home to six species of baobab trees including *A. za*, *A. rubrostipa*, *A. madagascariensis*, *A. perrieri*, *A. grandidieri* and *A. suarezensis*. The remaining species, *A. gibbosa*, is native to north-western Australia. Reports of mortality of *A. digitata* have raised concern that these trees may be vanishing from the African landscape. Very little information is available regarding the fungi, either beneficial or pathogenic, on these trees. A study of the fungi present on the trees was thus undertaken to determine the possible causes of disease, where present, and to establish what fungi occur endophytically in the trees. Isolations were done from both diseased and asymptomatic material from South Africa, Botswana, Namibia and Madagascar. The largest group of fungi isolated belonged to the Botryosphaeriaceae. Other commonly isolated fungi included species of *Aureobasidium* and *Phoma*. A number of fungi in the genera *Leptographium*, *Graphium* and *Gondwanamyces* were also found on dead trees. Pathogenicity trials remain to be performed to determine which of the fungi might cause disease of the trees. Results of these surveys will also provide a valuable platform for studies considering fungal biodiversity as well as baobab biology and health.

Botryosphaeriaceae occurring on native and introduced *Acacia* spp. in South Africa

J. A. van der Linde, B.A.D. Begoude & J. Roux

South Africa was one of the first countries to establish commercial plantations of introduced *Pinus*, *Eucalyptus* and *Acacia* spp. to provide timber for construction, fuel and the pulp industry. The *A. mearnsii* industry generates a high income due to the high quality of pulp produced from its timber. However, these trees regularly suffer from disease and pest outbreaks. During the 1990's, *Botryosphaeria dothidea* and several other Botryosphaeriaceae were reported from *A. mearnsii* trees as the cause of a canker and wilt disease. These identifications were, however, based only on morphology. In recent years the taxonomy of the Botryosphaeriaceae has undergone major changes and with the advent of DNA sequencing it has now become possible to finalize the identities of the Botryosphaeriaceae associated with diseases of *A. mearnsii* in South Africa. The aim of this study was to use both morphological and molecular tools to identify and compare the diversity of the Botryosphaeriaceae associated with native *Acacia* spp. and *A. mearnsii* in forestry areas in South Africa. Samples were collected from three areas and isolates were identified using a combination of morphological data, RFLP analysis and sequencing of the ITS and Elongation factor- α -1 gene regions. Results showed the presence of nine species, including *Spencermatinsia viticola*, *Neofusicoccum vitifusiforme*, *Neofusicoccum australe*, *Neofusicoccum parvum*, *Botryosphaeria dothidea* and four undescribed species. This study has uncovered an unexpected diversity of Botryosphaeriaceae, including several new species, strongly supporting the need for further studies of these fungi on *A. mearnsii* and native *Acacia* spp.



UPwithScience Meets Mushrooms

With the support of the CTHB, FABI participates in the UPwithScience project every year. "UP with Science" is a science enrichment programme for senior secondary school pupils presented by the University of Pretoria. For the programme, a number of learners are selected annually to take part in a three year programme (from Grade 10 to Grade 12), which includes Saturday classes once a month and a winter school once a year. The programme is aimed at increasing young people's knowledge of, interest and skills in science. This year the project presented by the CTHB will focus on mushrooms found in and around gardens in Pretoria. A group of seven very enthusiastic students will participate in the project hosted by our group. During the first meeting, the students with the assistance of Marcus Wilken and Bernice Porter (both FABI students) set out to collect some mushrooms for the project. These were their thoughts on the visit:

"On 21 February the Gr11 UPwithScience group started their project by gathering mushrooms. We started our trip in a minibus to the Botanical Gardens in the east of Pretoria. Our group hunted, searched, got dirty, Hannah got wet (went through a pond rather than around), but in the end we were successful. Under the watchful eye of Markus and Bernice (possibly the most energetic person we have ever met), we managed to gather many mushrooms. One of the samples was particularly interesting, we were sure it was covered in wood varnish! Jacques was probably the most enthusiastic, but that soon disappeared as he encountered some colourful arachnids.

After emptying the gardens of all mushrooms, an unsuspecting public park was the next target. Bernice charged in with students cautiously in tow. After a few new additions to the collection, the minibus was boarded and we set off for the experimental farm.

With aching backs, feet, and arms, we walked on our tiptoes in an attempt to find birds-nest fungi. We surrendered all hope, but Bernice did not. Perseverance succeeded and inside a cluster of Eucalyptus trees we managed to find an intact birds-nest fungus. A close-by plantation of Pine trees yielded a colourful stinkhorn mushroom, a phenomenon that send Bernice into a giddy state.

After taking about 200 photos, she recovered. Our last collection stop was the LC de Villiers cricket nets before we resorted to hunting down a slightly more urban kind of prey: Ice cream."



The orange stinkhorn that had Bernice excited. From this photo it is clear why!



The UPwithScience group showing off their varnished red mushroom. At the back left is Bernice Porter

The UPwithScience group evaluating the days mushroom catch.



The above thoughts could not start to capture the enthusiasm of the students. Using the samples the students collected they will identify the species using both molecular and morphological tools. This information will be used to present an EXPO project at the regional competition. Thank you to Bernice for the assistance during collections and to the CTHB for funding the trip.

Global Climate Dialogue

Prepared by Kershney Naidoo

In a historic moment of Justice for the Climate, the University of Pretoria played host to the Global Humanitarian Forum on the 28th of February 2009, where a joint initiative provided the platform for a landmark high level dialogue. The event was led by three key leaders from southern (Desmond Tutu), northern (Mary Robinson), and international (Kofi Annan) backgrounds. It aimed to establish a set of guiding global principles for a just response to climate change. Archbishop Emeritus Desmond Tutu, Mary Robinson (former President of Ireland and United Nations High Commissioner for Human Rights), and via video-link, Global Humanitarian Forum President, Kofi Annan (former UN Secretary-General) interacted with the more than 100 students and faculty members present during the debate. The intention of the Climate Justice Dialogue was to lend new impetus to an awareness of climate change and appropriate action for addressing it. The debate focused on a number of climate justice principles that the Forum had developed in collaboration with a range of civil society organizations. The Forestry and Agricultural Biotechnology Institute (FABI) was asked by Professor Calie Pistorius, the Rector of the University of Pretoria, to engage a team of enthusiastic students and academics to participate in the dialogue. FABI represented by a team of 35 eager, question-filled delegates made sure that their presence was seen as well as heard.

Climate Justice refers to the fact that much of the planet bears no responsibility for climate change, while the entire planet suffers its consequences. Mediated by BBC anchor Nisha Pillai, the privilege of being a part of such a high level dialogue had both students and academics abuzz. Beaming in via video link, Mr Kofi Annan silenced the audience with his powerful and heartfelt plea for mankind to take responsibility to protect our planet. Commenting that “it is a striking injustice that the world's poorest groups, who also pollute the least, suffer the most under climate change”, Annan alluded to the fact that we, as a civilization, must pay greater attention to our lifestyles, which ultimately impact the planet. Archbishop Tutu in all his grace, set the tone for the dialogue when in his opening address he described just how ghastly the impact of climate change was at a South African level. The recent flash floods in the Soweto Township changed the lives of many poverty stricken South Africans, leaving them homeless and having to pick up the pieces and re-build their lives. Mary Robinson in her address also pleaded with the audience to enforce the overarching eight principles as set out by the GHF. Further, she remarked on the need for the Kyoto Protocol to be seen as a matter of grave urgency in the upcoming G8 Summit. It can no longer be overlooked, action needs to be taken, more so against polluters of the planet.



His grace, Archbishop Desmond Tutu presenting his opening address.



Beaming in via video-link, Mr Kofi Annan captivated the audience with his humility and sincerity.

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Identified as the “global south”, South Africa was chosen as the voice of awareness. Addressed by Professor Pistorius, it became clear that with the change in the climate, developing countries were disproportionately affected, thus making the need for strong leadership from both politicians and the people of vital importance. Students and academics were identified as a critical element of that sensitization and mobilization processes. Questions posed from both the audience and via the live web cast, were addressed by the panel of highly prestigious leaders. Awareness of climate justice was most definitely addressed with the ultimatum been placed in the hands of the young generation of leading scholars and scientists to act now in order to save the planet for future generations.

The dialogue ended in a commemorative tree planting ceremony. One of the FABI group and a participant in the DST/NRF Centre of Excellence in Tree Health Biotechnology (CTHB) programme, Kershney Naidoo, was chosen to represent the student body of the University of Pretoria in planting one of three trees. The other trees were planted by Mary Robinson and Professor Calie Pistorius. This act symbolized the need for significant reductions in the carbon footprint of the world's populace. At the end of the day all attendees were highly motivated to make a positive change in order to seek justice for the planet.



Professor Pistorius, Principal and Vice-Rector of UP, Mrs Mary Robinson and another member of UP staff, look on as Kershney Naidoo does her bit to reduce the global carbon footprint by planting a tree

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Team Building Day 2009 - Kwalata

The CTHB / TPCP Team Day this year was held at Kwalata Game Ranch, just north of Pretoria, on 16 January. This is an annual event when the whole group gets together to discuss relevant issues, prepare for the year ahead, socialize and just have fun. The day started at 8am with coffee and tea to get the mind and body working. We then quickly moved into discussion time. Some of the main issues discussed were bursaries, work experience, lab cleanliness and field trips. In addition, thoughts were shared on how to 'lift the bar' with regards to science excellence in the group. The quality and quantity of science from the group is already remarkably high, but there are always areas that can be improved. At tea-time the students formed break-away discussion sessions. They were asked to make a LOVE, HATE, CHANGE, SAME list – things they love about the group, hate about the group, would like changed in the group and would like to stay the same in the group. The lists were discussed in the bigger group and the feedback was very positive. The lists clearly showed the great group we have, but also gave the students an opportunity to voice any grievances they had, and their ideas for improvement.



After some great constructive discussion it was time for a hefty lunch and then straight into some fun activities. The activities included many unusual but enjoyable challenges to both body and mind. From booting up the most primitive computer with your feet, to working your team through a maze and instructing blind-folded team mates to pick up balls, ... or to walk into thorn trees – oops! And after a very full day of discussion and fun – and thankfully no injuries – it was time to jump in the pool (for the few water-lovers) and then enjoy an amazing boma braai, shared with an incredible, diverse and dynamic group of friends and colleagues.

