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CONTENTS Page

MESSAGE FROM THE IPPS PRESIDENT

Dear IPPS Members,

Happy 2012! I hope this year brings you all health, happiness, and new insights into parasitic plants.

Future meetings. The next opportunity for a parasitic plant meeting will be a joint IPPS symposium with the International Weed Science Society Congress, which will take place from June 17-22, 2012 in Hangzhou, China. However, in order to ensure that we have sufficient attendance at this event, please indicate your interest right away by emailing Hanan Eizenberg (eizenber@agri.gov.il.). This is a great opportunity for our society to connect with parasitic plant researchers from Asia and the Pacific region who don't usually have the ability to travel to our typical congress location in Europe.

The next major conference, the 12th International Congress on Parasitic Plants, will take place in Sheffield, UK on July 15-19, 2013. Local arrangements will be handled by Julie Scholes and Duncan Cameron, with Koichi Yoneyama leading planning of the scientific program. The venue will be the Edge Conference facility at the University of Sheffield, and is located just next to the Peak District National Park, one of the most beautiful national parks in the UK. Block out your calendars now!

Upcoming IPPS elections. It is time for another round of IPPS elections. Three positions are open this year: Vice President, Secretary, and Member at Large. You may think that we just recently held elections, and indeed it was about a year ago that we elected a new Editor, but that election had been delayed and should have occurred in 2010. To remind you of recent society history, officers serve staggered four-year terms with about half the Executive Committee elected every two years to maintain continuity on the Committee. The Vice President position is special in that it comes with one major stipulation; The Vice President ascends to the Presidency at the end of the term, so this position actually carries an eight-year commitment. (Koichi Yoneyama with make this transition to President in the next few months.) You will receive a separate announcement this spring to solicit nominations for the election, so please start thinking about who you would nominate (self nominations are welcome) and whether you would agree to serve if nominated.

Final words. My term as IPPS President will soon end, so this is the final column I will write in this capacity. Each time I set out to write the President's Message (eight times since 2008!) I have struggled with what to say. Of course there is always the business of the society: the forthcoming or completed congresses, elections, and administrative matters of many kinds. These are all important and I have dutifully reported them because that is the job of the President, but it strikes me as too much mundane bureaucracy. I would prefer to use this space to cheer progress in parasitic plant research, although that seems superfluous considering that readers have generally devoted their lives to the subject. Also, there is simply not enough space to adequately capture the energy in this field. Perhaps the best I can do is encourage you to read the rest of this newsletter and appreciate the breadth and depth of progress in just the past six months!

In closing I will say that it has been an honor and a pleasure to work with IPPS. I am grateful to everyone who has contributed to the society in even a small way, and especially to those who have taken on the major jobs of organizing congresses, serving as an officer or contributing to Haustorium. Although I am stepping aside from official duties, I look forward to continuing parasitic plant research and supporting the society for many years to come.

Sincerely,

Jim Westwood, IPPS President
westwood@vt.edu

A NEW SPECIES OF BALANOPHORACEAE FROM BRAZIL

In 1996, Prof. Ruy J. Válka Alves from the National Museum, Rio de Janeiro, was called to the type locality of the plant referred to herein. The person who had found the plant thought it was a strange orchid (it does resemble Australian *Rhizanthella gardneri*). The Itatiaia National Park is a high diversity hotspot of the Atlantic Rainforest of southeastern Brazil. Prof. Alves preserved a sample in alcohol for later studies, but the specimen remained untouched for a decade, when the first author examined the material and became convinced that it belonged to a new species of *Langsdorffia*. We then analyzed all *Langsdorffia* collections in many herbaria, covering the distribution of *L. hypogaea* Mart., thereto the only known American species of the genus. We concluded that none of the variations within *L. hypogaea* were consistent with that of the new taxon. Furthermore, the herbaria yielded further specimens of the new species, all collected in Itatiaia, the oldest collection being from 1957.

In 2006 a new search expedition to the type locality took place. It was successful, thanks to the help of Mr. André Vieira, who had taken Prof. Alves to the site back in

1996. The type locality is a cloud forest at an altitude of 1940 m a.s.l., a site which harbors many endemic species. The 1996 collection had only female inflorescences, not permitting the observation of the main distinctive characters, present on male inflorescences. Finally, in 2009, fertile male material of the new species was collected near the original site, along with a specimen clearly belonging to *L. hypogaea*, proving both species grew sympatrically in that locality. This finding gave us the confidence to publish *Langsdorffia heterotepala* L.J.T. Cardoso, R.J.V. Aves & J.M.A. Braga. The specific epithet refers to the different shapes of the three tepals in the male flowers, which are identical in *L. hypogaea*. Further distinctive characters of *L. heterotepala* include the conspicuously Y-shaped connective; a flat male inflorescence; scales with a corrugate apex and female flowers with shorter styles. The ecology of this new species is poorly known. Not even the species of the host plant was determined. The currently known distribution is restricted to cloud forests above 1500m a.s.l., which encompass the Itatiaia massif, an area of less than 30 km^2. It seems probable that *L. heterotepala* also occurs at similar altitudes in the Mantiqueira and Serra do Mar massifs, and even in other States. An intensified collection effort might shed further light on the distribution of this species and its conservation status.

Langsdorffia heteropetala photo J.P. Condack

For more information see the complete article:
Cardoso, L.J.T., Alves, R.J.V. and Braga, J.M.A.. 2011. A new species and a key for *Langsdorffia* (Balanophoraceae). Systematic Botany 36(2): 424-427.

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HYDNORA VISSERI – A REMARKABLE PLANT TO HONOUR A REMARKABLE MAN

In a memorial lecture at the University of Stellenbosch on 9 March 2011 attended by his widow, Thresia Visser and children, Erika Maass announced the naming of a new species of *Hydnora* in honour of Prof. Johann Visser and paid tribute to a great figure in the world of parasitic plants who sadly died so soon after his retirement, in 1990.

'My association with the late Prof. Johann Visser started 30 years ago when I, as a young undergraduate student, walked into his Plant Physiology class at the then Department of Botany, at the University of Stellenbosch. As post-graduate student, I was quickly introduced into the world of parasitic plants and soon realized that *Hydnora* was without doubt one of Prof. Visser's all time favourites – this strange, most un-plant-like of all angiosperms with the beautiful albeit stinking flowers!

Johann Visser spent many hours *Hydnora*-hunting in his little red pickup– an activity that was rewarded when he rediscovered the evasive *Hydnora triceps* in the Springbok area. The previous known collection of this strange plant was 150 years earlier and there was still much to learn from these weird plants when Prof. Visser fell ill and died in 1990.

Before his death, Prof. Visser appointed Prof. Lytton Musselman, a friend and colleague from Old Dominion University in Norfork, Virginia, as the external examiner of my Ph D thesis which dealt with the germination requirements of *Striga*, another genus of parasitic flowering plants. When, a few years after Visser's death, Musselman became interested in furthering his work on *Hydnora*, and was looking for a collaborator in Namibia, I was the obvious choice – the only one he knew in Namibia!

This was the beginning of a very successful and fruitful collaboration - building on the foundation laid by Johann Visser, researchers from the University of Namibia and Old Dominion University in Norfolk, Virginia, worked together over the past 10 years to unravel the mysteries of this remarkable genus. Our group was not only the first to successfully germinate *Hydnora* seeds, but we also documented the distribution of *Hydnora triceps* in Namibia, and recently described a new *Hydnora* species from the Karas Region of Namibia and the Northern Cape Province of South Africa. This species is a distinct segregate of *Hydnora africana sensu lato*, and to honour the contribution made by Prof. Visser to our current understanding of parasitic plants, this new species was named *Hydnora visseri* (see Bolin, J., Maas, E. and Musselman, L.J. 2011. A new species of *Hydnora*

(Hydnoraceae) from Southern Africa. Systematic Botany 36(2): 255-260 in Literature section below.)

Hydnora visseri is known from the Karas region of Namibia and the Northern Cape Province of South Africa. This distribution follows that of its obligated hosts *E. gregaria* and *E. gummifera* in winter and transitional rainfall (summer-winter) areas of Namibia and South Africa. The type locality is the sandy valley floor of Namuskluft, an important endemism hotspot in Southern Africa and contains impressive stands of *Euphorbia gummifera* and its parasite *H. visseri*. In South Africa, *H. visseri* has only been observed in the Richtersveld. However, *E. gregaria*-dominated flats are common in the eastern portion of the Northern Cape Province near the Namibian border settlement of Ariamsvlei and its presence there is expected.

Hydnora visseri photo Jay Bolin

Some of my lasting memories include the respect he showed to his students. Despite an extremely busy schedule, and long queues of people in front of his office door waiting for a chance to consult him, he always made time for each and every one – listening attentively and patiently - offering his wisdom. I was very fortunate that I never had to queue at his office door – one of my tasks as his research assistant was to, every evening before I left for home, switch on the percolator to make a fresh pot of coffee that was left throughout the night to brew. And when he then came into my office early the next morning for his first cup of coffee, I had his undivided attention.

He taught me a lot of things – from the intricacies of photosynthesis to the amazing life strategies of *Hydnora*. However, much more important than what he taught me, is what I learned from him – the virtues of hard work, dedication and commitment. For his contribution to the person I am today, and the influence he had on all that crossed his path, I wish to salute Johann Visser – the Southern African father of parasitic plants.

I so wish that tonight, before I go home, I could once more switch on the coffee machine so that tomorrow, over a cup of strong, black coffee as he liked it, we can ponder over the wonders of a plant now known as *Hydnora visseri*.'

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THE MYSTERIOUS STERILE DODDER IN BRUNEI DARUSSALAM (NORTH-EAST BORNEO)

Along the waterways and ditches of Brunei Darussalam careful observers can spot strange looking tangled masses of spaghetti thrown over the vegetation. Of course we are discussing the genus *Cuscuta* which was once mistaken to be *Cassytha filiformis* among local naturalists and botanists due to its striking resemblance. One of the most convenient methods of differentiating these two species quickly in the field is by scanning the stem under a hand lens. Stems of *Cassytha* tend to be rather woody, coarse and ridged due to the presence of numerous waxy-plates, compared to *Cuscuta* with a smooth and relatively shiny surface.

So far, only *Cuscuta australis* R. Brown has been documented based on flower morphology (Chak *et al.* 2010) in Brunei Darussalam. Surprisingly, of the 450 odd sites of dodder populations in Brunei Darussalam, only one population has flowered during four years of regular observation. The rest of the populations have remained completely sterile, thus arousing our interest. Molecular identification of these sterile *Cuscuta* populations in Brunei Darussalam using ITS and *trnL-F* DNA sequence data has indicated that all sterile populations of *Cuscuta* sampled are *C. australis*.

Sterile *C. australis* is usually found parasitizing *Mikania micrantha* along the waterways and low-lying areas in Brunei Darussalam and appears to go through cycles of rapid growth and perennation. The periodicity and stimuli for perennation are unclear. Perennation of *Cuscuta* was first reported by Rao (1939), whereby the young perennating *C. reflexa* shoots emerged from the absorbing tissue of the haustoria embedded within the body of the host. However, the perennating mechanism described for *C. reflexa* differs from the perennation of *C. australis* observed in Brunei, whereby the young

perennating shoots originate from the central pith instead of the haustorium tissue of the parental strand (see plate 1a - b). This perennating strategy of *C. australis* suggests that the reproduction is from food reserves. However, this hypothesis remains to be tested. During the perennating stage of *C. australis*, several young shoots of varying lengths were observed to emerge at several points along the parental strands. Further elongation of these young shoots results in the fresh attack of any nearby potential host plants.

Paucity of flowering populations of *C. australis* in Brunei remains an enigma. This species is mainly distributed in less strictly equatorial latitudes; throughout southern Europe, in South–Southeast Asia, in Australia (Liao *et al.* 2000) and also in the USA (Holm *et al.* 1997). Suppression of flowering in *C. australis* for several years may be an exclusive adaptation that associates to the ecological conditions in the tropics (i.e. day-length and dark period) or perhaps related to major climatic phenomena (i.e. *El Niño* and *La Niña*) (Kelly *et al.* 2001). Fratianne (1965) claimed that certain *Cuscuta* spp. may express flowering synchronicity with the host however this does not appear to be the case here. The factors that could trigger the initiation of flowering of sterile *C. australis* populations in Brunei Darussalam remain unknown. With only one exception, all dodder populations across Brunei Darussalam have remained sterile over four years. This raises the concern of future simultaneous flowering and seed dispersal in response to some as yet undetermined cue. The sudden outbreak of an introduced parasitic vine *via* simultaneous seed formation may pose a threat to native plants in the riparian zones and to crops commonly cultivated in Brunei such as beans, lettuces and tomatoes. Cultivated crops may be extremely susceptible due to the potential of irrigation water contaminated with *Cuscuta* seeds. Hence, timely precautionary measures should be taken well in advance before any possible future outbreak.

Acknowledgements
Funding for this study was provided by the National Development Plan, Brunei Darussalam University Brunei Darussalam (UBD) Science and Technology Research Grant No. 8. Molecular work at Old Dominion University was supported by the Mary Payne Hogan Endowment.

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WIKIPEDIA

Wikipedia needs well-written treatments of parasitic plants crafted by specialists. If you are interested in participating in this project, please contact Lytton Musselman (lmusselm@odu.edu)

SEASONAL GREETING

For a (late) seasonal greeting check www.youtube.com/watch?v=LUjn3RpkcKY and see why Google Alerts for 'mistletoe' have recently been providing an excessive number of hits.

CONGRATULATIONS TO PROF. ZEYAUR KHAN

Prof. Zeyaur Khan, the ICIPE scientist, leader of the widely-reputed push-pull programme, has been named co-winner of the 2011 TWAS Prize for Agriculture. The TWAS Prizes, awarded by The Academy of Sciences for the Developing World, honour individual scientists in developing countries in recognition of an outstanding contribution to knowledge. See item below under Press releases.

PRESS RELEASES

'ICIPE scientist and leader of the push-pull programme wins TWAS Prize '

Prof. Zeyaur Khan, the leader of the widely-reputed ICIPE push-pull programme, has been named co-winner of the 2011 TWAS Prize for Agriculture. The TWAS Prizes, which are awarded by TWAS, The Academy of Sciences for the Developing World, honour individual scientists in developing countries in recognition of an outstanding contribution to knowledge. Based in Trieste, Italy, TWAS promotes scientific excellence and capacity in the South for science-based sustainable development, through a range of programmes that includes research grants; awards and prizes; fellowships and associate fellowships. The TWAS Prize adds to Prof. Khan's growing list of accolades for his work as the leader of the push-pull programme, an innovative technology that simultaneously addresses the three key constraints of cereal production in Africa; stemborers, *Striga* weed and poor soil fertility.

The push-pull technology was developed by Prof. Khan at ICIPE in collaboration with Rothamsted Research in the United Kingdom, Kenya Agricultural Research Institute and various national partners, with funding from Gatsby Charitable Foundation (UK). Further research and development of the technology has been funded by the European Union, the Kilimo Trust (East Africa), Biovision Foundation (Switzerland) and McKnight Foundation (USA), among others. The technology involves intercropping cereals with a repellent plant such as *Desmodium*, and planting an attractive trap plant, for instance Napier grass, as a border crop around this intercrop. Stemborers are repelled or deterred from the target crop (push) and at the same time they are attracted (pull) to the trap crop, preventing damage on the cereal crop. In addition, *Desmodium* provides a novel means of *in situ* reduction of the *Striga* seed bank in the soil through efficient suicidal germination: the plant stimulates the germination of *Striga* seeds and inhibits their growth after they germinate.

Today, more than 50,000 farmers in eastern Africa are practicing the push-pull technology on their farms, dramatically improving their cereal yields. Moreover, the technology enables small-scale farmers to venture into dairy cattle and goat keeping, as both *Desmodium* and Napier are excellent fodder crops. Moreover, *Desmodium* fixes nitrogen and helps retain moisture through natural mulching, prevents soil erosion, and is also a perennial crop, which enables it to exert its *Striga* control effect even when the host crop is out of season.

In 2010, Prof. Zeyaur Khan received the designation of Fellow of the Entomological Society of America (ESA), which is accorded to individuals who have made outstanding contributions to the science of entomology – the scientific study of insects – with only 10 such distinction made annually. In addition he was elected to the Council of the International Congress of Entomology, and nominated Distinguished Scientist, International Branch of Entomological Society of America. Prof. Khan also received the designation of Fellow of Royal Entomological Society, London, and was also the 2010 winner of ESA's Nan-Yao Su Award for Innovation and Creativity in Entomology. In 2009, Prof. Khan was selected the winner of the International Integrated Pest Management (IPM) Achievement awards, which are given to individuals or teams who have made significant contributions to the advancement of IPM, with at least one extraordinary achievement. In 2008 he was a plenary speaker at the 23rd International Congress of Entomology.

Henry Neondo, Africa Science News Service, December 2, 2011.

'Green tech reins in noxious pests'

A unique technology that uses a weed and napier grass to keep a close rein on a pest that attacks maize is bringing good tidings to farmers. The 'push and pull' intermediate technology can fight the *Striga* weed and control the maize stalk borer instead of using pesticides.

For the technology to work, napier grass is planted around the maize field to attract (pull) moths. Its attractive scent pulls nearly three quarters of the borer insects, which go to lay their eggs in the grass instead of the maize. This reduces the chances of the crop being attacked. On the other hand, *Desmodium*s unpleasant smell sends away (keeps off) the moths about 30 days after the maize has been planted. The insects go away in search of a suitable place to lay their eggs.

Reduce on use of fertiliser: The protein-rich legume *Desmodium* that is planted after every three rows of maize also fixes nitrogen nutrients in the soil, thus reducing the cost of adding fertiliser. 'I was reluctant to invest in cattle because I didn't have enough feeds, but this technology has changed my mind. I now keep cattle because I do not want to continue selling the animal feeds in my farm,' said Mrs Eunice Simiyu, a farmer from Muyai village in Bungoma County, who first planted maize under the push and pull technology last year. She now rears two dairy cows.

Mr Ben Gitahi, a farmer at Rwaitira village, Gatanga District in Central Kenya who has adopted the technology said he has been able to harvest more from his quarter-acre piece of land and spends less on farm

inputs. ‘I now harvest six bags instead of two after I adopted this agricultural practice two years ago,’ said Mr Gitahi.

The technology is also useful in livestock rearing. To feed animals, napier grass is mixed with *Desmodium* in a ratio of 3:1. ‘Milk production has increased as a result. *Desmodium* further suffocates the *Striga* weed, which has been a threat to crop production. It is also a cover crop that retains water for long and cuts the effects of soil erosion,’ says Mr Patrick Waboya, the patron of Simana Farmer Field School.

The technology is being spearheaded by scientists from the Kenya Agricultural Research Institute (Kari) and the International Centre of Insect Physiology and Ecology (ICIPE). Mr Samuel Njihia, the coordinator of the project, said maize, which is the countrys staple crop, takes a larger space because it is the main focus for the farmers. ‘The rest only come in to safeguard maize from the pest, which weakens stems and eventually leaves the crop withering,’ said the Kari scientist. He added that the biological control method, whose efficacy was rated as high as 70 per cent, had improved maize output and livestock production. ‘In the use of natural agents to increase yields, remaining with a risk of between 10 to 30 per cent, as is the case under this technology, is an economically viable option and this is a great success,’ said Mr Njihia. Domestication of the technology, he said, was informed by concerns about declining soil fertility and failure of other pest control methods. Farmers have been using ash, soil, and chemicals to eliminate the stem borer disease. The scientist said the seeds of the *Desmodium* legume are available at the Kenya Seed Company and mature vines from the crop can be replanted.

Mr Zakayo Saitoti, a technical assistant at Kari, said some farmers in Central, Nyanza, and Western Kenya had been trained and were assisting in sensitising their colleagues about the economic value of the technology. ‘We have identified demonstration sites and with the help of partners such as officials from the ministry of Agriculture and Icipe, many farmers have been brought on board,’ said Mr Saitoti. Icipe is coordinating the project in Western, Nyanza, Central, and parts of Rift Valley provinces. He said the push and pull technology contributes to environmental protection as no toxic substances are released.

By Dennis Odunga dodunga@ke.nation.co.ke
Daily Nation November 29 2011 at 00:00

‘Kenya: local scientists develop weed-resistant sorghum’

Local farmers will have a new sorghum variety resistant to the feared *Striga* weed at the end of this year. *Striga* attacks sorghum by growing into the roots where it sucks out water and nutrients. It slowly kills the plant and three weeks later emerges from the soil having done most of the damage. Director of the Kenya Agricultural Research Institute (Kari) Ephrain Mukisira said the new *Striga*-resistant variety could be available to farmers in December this year. ‘In some cases *Striga* has caused more than 100 per cent damage. This has really discouraged farmers,’ he said yesterday. *Striga*, also known as a witch weed, is difficult to manage and can stay under the ground for more than 15 years waiting for a farmer to plant cereal crops which facilitate their growth.

Yesterday, Dr Mukisira said they are testing preferred varieties in the field before releasing the seeds to farmers. The Kari director was speaking in Nairobi at a meeting organised by the Africa Biodiversity Conservation and Innovations Centre and the Association for Strengthening Agriculture Research in Eastern and Central Africa. The meeting was also attended by scientists from Sudan and Eritrea where more than 50 weed-resistant varieties have also been tested.

Sorghum is highly profitable and has rebounded in Kenya as a key cash and food crop. Dr Mukisira said it offers better returns than maize in the face of unreliable rains because of climate change. The East African Breweries also plans to buy sorghum from farmers for its popular keg beer. The ministry of Agriculture says although sorghum growing had declined since 1976, last year farmers produced more than 130,000 metric tonnes. ‘We are at the tail-end of developing technologies that offer hope for problems that have been very serious sorghum production constraints in East and Central Africa. In a year's time we should have products ready for farmers,’ says Dr Dan Kiambi, director of the Africa Biodiversity Conservation and Innovations Centre.

The UN Food and Agriculture Organisation estimates that in the Horn of Africa, *Striga* destroys about USD2.89 billion worth of maize and sorghum every year, sorghum suffering 86 percent of this loss. Maize is the most popular cereal in Eastern and Central Africa, followed by sorghum.

John Muchangi
Nairobi Star. 20 September

‘Uganda: Striga weed, the African farmer's enemy’

Farmers specialising in growing cereal crops in Uganda and other parts of Africa have of late suffered low yields as a result of the striga weed invading their gardens. In Uganda the weed has mostly hit farmers growing cereal crops in eastern and northern Uganda.

Striga weed according to crop science experts is a parasitic weed that grows in farmers' fields where cereal crops such as maize, millet, sorghum and rice are grown. It is a weed that attaches its roots to the roots of a cereal crop for purposes of obtaining food thereby causing stunted growth to the plant. According to Dr Michael Otim a crop entomologist at the National Crops Resources Research Institute (Nacrri) in Namulonge, in Uganda, the striga weed tends to attack maize, millet and sorghum crops. The weed has also been reported in western Kenya, Southern Sudan, Tanzania, Nigeria, Rwanda as well as South Africa especially in maize fields.

Dr Otim said there are two types of striga which include *Striga hermonthica* with purplish flowers commonly found in northern Uganda and *Striga asiatica* which has yellow flowers commonly found in eastern Uganda. In as far as the East African regions are concerned, three major striga zones have been identified and these include the Lake Victoria zone, the inland dry zone found in Tanzania, the inland moist zone found in Uganda and a conterminous coastal zone found adjacent to the Indian ocean in both Kenya and Tanzania. The most affected zone is the Lake Victoria zone with the largest extent of slightly over 850,000 hectares. The weed is said to cause 50 per cent to 80 per cent crop loss in the entire region. Tanzania has the largest area of striga infestation totalling over one million hectares of land. Uganda has 262,000 ha of striga infestation. A large portion of Uganda's striga plagued areas are located away from Lake Victoria, near the Kenyan border and the country reports that 31.9 per cent of its maize is under infestation. Tanzania has the largest share of its maize acreage under striga attack, with 36.9 per cent of its three million maize acres affected mostly in Terima and Serengeti district. Kenya has 216,000 hectares of striga hit cropland, with most of it found near Lake Victoria. Therefore, across East Africa, the economic impacts are substantial, totalling over $568m a year.

Dr Otim says the weed produces up to 50,000 seeds which can remain dormant in the soil for 10 years and it grows mostly in less fertile soil, the reason why farmers' fields are being attacked by the weed these days, yet it has been in existence for over 100 years. He adds that when farmers in eastern Uganda expressed concern over the weed, a team of science experts started the push pull technology where the Napier grass is planted on borders of the cereal crop field and the desmodium used for controlling maize stem borers in between the rows.

Crop scientists in Serere are also working on a sorghum variety that is resistant to the weed. The head of the cereals crops research at Namulonge, Dr Godfrey Asea, said his team is working on a number of maize varieties that are resistant to the weed. This is because previously farmers were advised to uproot the weed once they site it in their gardens but because the weed has attractive flowers, many farmers thought it was not a dangerous weed. The team has acquired a maize variety called Imazobil Resistant (IR) maize from International Maize and Wheat Improvement Centre, which is coated with herbicides to avoid attack on the plant. The herbicide kills the roots of the weed and increases the soil nutrient, thereby making it unfavourable for the weeds to grow. Scientists in Kenya have already come up with resistant varieties against the weed which they have released to farmers in Western Kenya.

The Agricultural inspector at the Ministry of Agriculture, Mr Isaac Wamasembe said as regulated by the ministry, when conducting their routine field work, they advise farmers to guard against the weed by leaving the land fallow for two to three years before planting a cereal crop for the second time on the same land. The ministry also inspects seeds that are brought into the country to avoid incidences of some seeds being imported with mixed invasive weed seeds. Farmers are also advised to practice intercropping where cereals are planted with legumes.

Mr Moses Okello, a farmer hailing from Dabani village in Busia, says, ‘The weed has been wiping off our cereal crops because a garden where farmers could harvest one bag of maize, once infested with the weed, will yield half a bag of maize.’
He said most farmers know about the weed but could not devise a method of controlling until the push-pull technology was introduced. He has however urged scientists to come up with another control method for their cassava crop where the weed is sometimes spotted because the above technology only works with cereal crops.

Afedraru Lominda alominda@ug.nationmedia.com

‘Maize ‘Green Revolution’ coming soon’

Nigeria will increase its maize production within the next few years by 150 percent to 20 million tons per annum. Current produce output stands at 8 million tons. This move is part of efforts by the federal Ministry of Agriculture and Rural Development to enhance food security, create jobs, and more importantly, cushion the oil-rich nation from the effects of rising food prices. According to the minister, Akin Adesina, the new efforts will transform the maize industry and make farming in general more profitable.

Maize is a staple food for millions of Nigerians, and its productivity has been stymied by low adoption of improved seeds, poor seed quality, little or no use of fertilizers, low investment in research funding, and poor extension services. In the 1980s, Nigeria experienced a silent Maize Revolution in the savannah but the transformation was not sustained. 'We have begun a journey of transformation—a journey to re-engineer Nigerian agriculture for high impact and success,' Mr Adesina said during a meeting with a team of maize experts in Abuja. Mr Adesina called on the experts to translate research and innovations into impacts on farmers' fields, adding that 'we must do this at a scale that can reduce hunger and poverty.' According to him, government has resolved to 'rebuild the broken walls of Nigeria's agriculture. 'Our resolve is clear: Grow Nigerian Agriculture.' he added.

Last Sunday, the maize team submitted a blueprint on how to achieve the new targets. Dr Sam Ajala, a Maize Breeder at the International Institute of Tropical Agriculture (IITA), which is headquartered in Ibadan, said the focus on maize was a step in the right direction. 'If you look at maize, it has the highest return on investment [ROI] compared with other crops. So if we are able to get it right in maize it will be great,' he said.

Researchers aim to leverage on earlier successes recorded under the Doubling Maize Project that proved that maize yield could be doubled on farmers' fields. The new move will also benefit from the plethora of innovations lying dormant in international and national research centres waiting to be adopted by farmers. For instance, high-yielding and disease-resistant varieties that are adaptable to Nigeria's various agroecological zones, as well as drought- and Striga-resistant varieties that could address on-farm stresses will be deployed to farmers. Early, intermediate, and late-maturing varieties with yields up to thrice as much as traditional varieties will help farmers tackle the negative effects of climate change.

'We are optimistic that if given the necessary support we will achieve the 20 million tons target,' Mr Ajala said.

Leke Adeyemi
'Next' September 13, 2011.

Cuscuta japonica in California

Comparable to the story of non-flowering *Cuscuta* in Brunei above, a similar occurrence of numerous non-flowering infestations of *Cuscuta japonica* in California was reported in Haustorium issue 51. A new infestation there has now been reported from Santa Barbara County as in the following and subsequent press releases:

http://www.lompocrecord.com/news/local/article_c359e064-cedd-11e0-9883-001cc4c002e0.html

'Mistletoe League Project - A survey about mistletoe, and mistletoe management, on fruit trees (in UK).' (extract from full text)

A survey about mistletoe (*Viscum album*) on fruit trees, aiming to gather useful information on management practices and attitudes, its harvest, and on any host varietal preference.

Most mistletoe in the UK (and in other parts of northern Europe) grows on fruit trees, mainly apple, and so it is a particular feature of orchards and gardens. This phenomenon is particularly obvious in orchards in mistletoe's preferred growing area of the English south-west midlands (Herefordshire, Worcestershire, Gloucestershire and Somerset) and across the Welsh border in lowland Monmouthshire. For gardens the phenomenon is more widespread - as much mistletoe has become established on garden fruit trees well outside its natural geographic area.

Mistletoe will grow on many other host tree species too, but it is only usually harvested from fruit trees, as the 'crop' is easily reached in these. Mistletoe is, and probably always will be, fairly common on other hosts (*Tilia* spp., poplars, willows, hawthorns) in the wider countryside in its natural area, but it is difficult to crop from those hosts.

Several problems seem to be arising for mistletoe because of this fruit tree association. Firstly, the huge, and continuing, loss of traditional orchards in recent decades must be reducing opportunities for cropping mistletoe, and reducing the harvest long-term. But how significant is this problem? We have no figures for mistletoe trading, and no way to tell whether the threat is really becoming critical yet, and if not yet, when it will be. Secondly, the decline in economic value for the remaining traditional orchards means that many are significantly neglected. The fruit crop is often left on the ground in these 'remnant' orchards and the trees left unpruned.

A short/medium-term side-effect of this second point, in mistletoe's core growing areas is (ironically) a glut of mistletoe. Fruit trees, particularly apple, in the neglected orchards of this area often develop huge growths of mistletoe - far too prolific for the tree to support, and leading to premature death of both tree and mistletoe.

At present there might seem to be plenty of mistletoe in these situations, but it is clearly not sustainable. But, as with the first problem, no data exist to measure this

problem. A key unknown is how the owners and managers of these orchards perceive the mistletoe - do they understand the issue, are they acting on it, do they know what to do, if not why not, is it simply to do with economics and manpower, and so on. Not just orchards - garden trees too:

The management issue also arises in gardens with mistletoe, where it is not unusual to see an apple tree festooned with abundant mistletoe, of which many gardeners are very proud. But the amount can quickly become unsustainable and it is not unusual to hear of prized mistletoe trees suddenly dying, or falling in winter storms. But most information is anecdotal -is this a real problem or not?

The League Project is also aiming to gain information on varietal preferences. In some core area orchards it is obvious there is some preference - with mistletoe abundant on some trees but relatively poor on others. Sometimes this can be explained from management history - but sometimes it appears to be related to the fruit variety. Some seem more susceptible, or more resistant, than others. So, could a Mistletoe League Table be drawn up showing which varieties are best and worst for mistletoe? And could this be used to help manage mistletoe where it is overabundant, or encourage it where it is scarce? As above, there are currently no data, and it would clearly be useful to have some. The Mistletoe League Project aims to gather information on all these issues.

The project has been split into two parts: Part 1 is a questionnaire for fruit tree managers who deal with mistletoe (1a is for orchard managers, 1b is for gardeners) Part 2 aims to gather information on varietal preferences. Rapid results are not anticipated! The project is likely to run for several years, building up more information each winter season from 2011/12 onwards.

Mistletoe Matters Consultancy is run by Jonathan Briggs, a national mistletoe expert with over 25 years research experience with this parasitic plant.

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Mistletoe Matters Consultancy
November 2011

MEETING REPORTS

APS/IPPPC Joint Meeting, Honolulu, Hawaii, August 6-10, 2011

The American Phytopathological Society (APS) and the International Association for the Plant Protection Sciences (IAPPS) held a joint meeting in Honolulu, Hawaii on August 6-10, 2011. The occasion brought together a large group of scientists interested in pathology and plant protection, which seemed to be the ideal venue for discussing parasitic plants with students and researchers who don't often have the opportunity to attend parasitic plant congresses. The session was well organized by Yaakov Goldwasser and featured a solid lineup of speakers.

Unfortunately, because the conference format consisted of a large number of concurrent sessions and this session was relegated to the final afternoon, the audience consisted mostly of familiar faces.

Jim Westwood.

Featured speakers were:

G. Ejeta. *Striga* – A formidable challenge to Africa's food security.
Y. Goldwasser. Broomrape management – difficulties and solutions.
B. Rubin. Selective and non-selective management of field dodder (*Cuscuta campestris*).
K. Yoneyama *et al.* Role of strigolactones in the host-parasite association.
J. Westwood *et al.* Genomics approaches to parasitic plant research.

5th Mistletoe Symposium: Mistletoe in Cancer Therapy – Basic Research and Clinical Practice, November 10-12, 2011.

About a hundred scientists and doctors from a variety of scientific disciplines and therapeutic approaches met at the European Academy of Otzenhausen (in Nonnweiler, Saarland) for the 5th International, Interdisciplinary Mistletoe Symposium. At the symposium, the latest results from research and clinical medicine were presented, discussed and compared, so as to put together a multidimensional and comprehensive picture of the current state of scientific knowledge on mistletoe extracts. Bridges were built not only between different therapeutic approaches, pharmaceutics and medicine, and basic research into mistletoe and use of mistletoe, but also between conventional and complementary oncology. The treatment of pancreatic carcinoma was chosen as a topic for special attention and was dealt with

in depth in a podium discussion both from the perspective of conventional oncology and in terms of the contribution which mistletoe preparations can make to the management of this condition. In addition, the participants at the symposium discussed and unanimously approved the wording of the "Second Nonnweiler Declaration" (see box at end of article for details). This declaration calls for the cost of parenteral administration of mistletoe preparations not only in the palliative but also in the adjuvant therapeutic setting to remain reimbursable by the German statutory health insurance (SHI) funds.

The symposium was organised and sponsored by the Karl and Veronica Carstens Foundation and the Society of Anthroposophical Doctors in Germany (GAÄD) in collaboration with the Society for Medicinal Plant and Natural Product Research (GA), the Society for Phytotherapy (GPT), the German Pharmaceutical Society (DPhG) and the Central Association of Doctors in Naturopathic and Regulation Medicine (ZAEN), with the International Association for Pharmaceutical Technology (APV) acting as a cooperation partner. The scientific organising committee was made up of Prof. Dr. Susanne Alban (Kiel), Prof. Dr. Hans Becker (St. Ingbert), Prof. Dr. Wolfgang Blaschek (Kiel), Prof. em. Dr. Dr. h.c. mult. Fritz H. Kemper (Münster), Prof. Dr. Wolfgang Kreis (Erlangen), PD Dr. Harald Matthes (Berlin), Prof. Dr. Dr. h.c. mult. Heinz Schilcher (Immenstadt) and Dr. Rainer Stange (Berlin). The symposium was coordinated by Dr. Rainer Scheer, of the Carl Gustav Carus Institute in Niefern-Öschelbronn.

A particular feature of this mistletoe symposium was the broad range of topics covered, reflecting the breadth of current research on this important medicinal plant. Pharmaceutical, pharmacological and medical topics were presented by means of 8 summary papers, 24 short lectures and 19 posters. The specific areas dealt with included pharmaceutical aspects of the manufacture of mistletoe preparations and the effects of various constituents, *in vitro* and *in-vivo* preclinical studies, studies on the immunology and cytotoxicity of presently marketed or developmental mistletoe preparations, clinical results obtained in various applications and tumour entities in both adjuvant and palliative therapeutic settings in both human and veterinary medicine, reports from medical practice, and clinical studies designed to demonstrate specific effects, the efficacy, the safety and tolerability of mistletoe preparations. All the abstracts from the symposium have been published in English in Phytomedicine (Elsevier-Verlag) 18 (2011), Supplement VIII and are freely available in the internet at www.ScienceDirect.com. The abstract booklets which are still in stock are available on request from the author of this article. The following paragraphs provide details of the summary papers and the topic of pancreatic carcinoma.

As might be expected, the focus of the pharmaceutical presentations was on mistletoe lectins, a class of substances present in mistletoe extracts which jointly determine the effects of these extracts. Professor Blaschek (Kiel) used immunohistochemical methods to determine the localisation of these lectins in the mistletoe plant and found differences in this regard between tissues and seasons. He showed that mistletoe lectins are mainly located in the shoots rather than the leaves, especially in the cortical parenchyma and in the outer sclerenchyma caps of the vascular bundles.

Based on the known structures of mistletoe lectins ML-1 and ML-3 (the molecular structure of ML-2 remains unknown), Professor Pfüller (Hamburg) discussed the biochemical and pharmacologically relevant properties of these proteins, which specifically recognise galactosyl/N-acetylaminogalactosyl target structures. In addition to the ribosome-inactivating (cytotoxic) lectins, a chitin-binding lectin (VisalbCBA) which is specific for glucosamine groups is also known to exist. The biochemical properties, biological availability and stability of the mistletoe lectins are influenced by other components of mistletoe extracts (viscotoxins, oligo- and polysaccharides).

Professor Klein (Tübingen) spoke about chronic and acute inflammation and the dual role of inflammation in the pathogenesis of cancer. A variety of immune and inflammatory cells are to be found inside a tumour. These immunocompetent cells influence the tumour cells in various ways (via cytokines, chemokines, growth factors, prostaglandins and reactive oxygen and nitrogen species). Inflammation influences every single step in tumorigenesis, from tumour initiation and tumour maintenance to tumour progression and metastasis. A rough distinction can be made between tumour-destructive inflammation (TH1 response, M1 macrophages, NK cells) and tumour-promoting inflammation (TH2 response, M2 macrophages). Both pro- and anticarcinogenic and inflammatory mechanisms are present simultaneously in developing tumours, but if the tumour is not eliminated, the procarcinogenic effects come to dominate. Signal transduction pathways which promote the procarcinogenic effects of inflammation often form a vicious circle. Certain immune and inflammatory components can exert positive effects on tumour growth during one stage of tumour development, but negative effects during another stage. Treatment with mistletoe preparations, which have long been reported to stimulate a large number of factors that influence (anticarcinogenic) tumour-associated inflammation via a

variety of mechanisms, can help break down immune tolerance to tumour antigens and positively influence the immune response to tumours. Nevertheless, the mechanism of such processes varies from tumour to tumour, and only by continuously expanding our knowledge of the complex interplay between different components of the anti-tumour response will we be able to develop better strategies for treating this disease.

In his talk, Professor Efferth (Mainz) reported on methods of predicting response to cancer therapy and on the significance of these for the development of personalised treatment strategies. In this respect he discussed a range of subjects including relevant cytotoxicity tests, immunohistochemical detection of prognostic markers of therapeutic response and patient survival time, and modern pharmacogenomic techniques (comparative genomic hybridisation, DNA methylation assays, mRNA microarrays, etc.). He compared data he had obtained using these techniques with clinical patient data, and presented the results of investigations aimed at predicting sensitivity or resistance both to cytotoxic agents and to phytochemicals used in complementary medicine. In doing so he emphasised the relevance of these methods to herbal medicines such as mistletoe preparations.

Dr. Breitkreuz (Bad Liebenzell) reported on recent developments in anthroposophical mistletoe therapy and on a series of expert conferences hosted by the GAÄD between 2008 and 2011. By reference to a number of case reports he discussed the topics considered at those conferences, namely dosing strategies (initiation of therapy: escalating dosage regimen or high initial dose), choice of host tree, choice of preparation, control of mistletoe therapy and methods of administration (subcutaneous, intravenous, intratumoral, intrapleural, intravesical, oral), with reference to differences between mistletoe preparations depending on their method of manufacture. He also discussed questions such as how mistletoe therapy and conventional therapy are coordinated and what should be done in the event of critical treatment incidents or side effects. In order to provide doctors who prescribe mistletoe therapy with well-founded information, new study concepts (e.g. qualitative studies) are being developed, data collection is being intensified (Network of Oncology, Havelhöhe Research Institute) and plans are underway for a new handbook (GAÄD, compilation of evidence on therapeutic use of anthroposophical medicines), the third edition (2013) of which is to include reference to mistletoe preparations.

Dr. Kienle (Freiburg) provided an overview of clinical studies on mistletoe preparations used in anthroposophical medicine and phytotherapy. More than 140 such studies have been published, of which 60 were prospective controlled studies. The study objectives were to improve quality of life, patient survival, tumour response, and safety and tolerability. Most of the studies yielded positive results, but due to methodological differences in quality some received more favourable reviews than others. One definite finding is that mistletoe preparations improve quality of life and the tolerability of conventional cancer therapies. Study data on safety and tolerability show that after parenteral administration of mistletoe preparations, side effects are mostly mild. Most common among these are local reactions (skin reddening, induration at the injection site after subcutaneous administration) and a slight rise in temperature. Both of these types of reaction indicate to the doctor that the patient is responding to the mistletoe therapy. There have been occasional reports of pseudoallergic reactions, but no reports of serious adverse reactions. Approximately equal numbers of studies have been conducted in adjuvant and palliative therapy settings. In recent years, regulatory authority demands have increasingly led to the performance of (in most cases randomised) clinical trials (RCTs), although many medical questions cannot be answered on the basis of RCTs alone.

The question of studies also received a lot of attention in the podium discussion on the main topic: “Treatment of pancreatic carcinoma”. In this discussion it was pointed out that RCTs investigate the effect or efficacy of drugs in highly selected patient groups, and do not always reflect real-world therapeutic situations. For this reason, greater importance is likely to be attached in the future to health services research and possibly also to evaluation of registry data as a means of acquiring medical and therapeutic knowledge. The Network of Oncology (NO; Havelhöhe Research Institute, Berlin) will likewise become more important. At present about 2000 patients per year are documented in the Network of Oncology.

In his talk on “Options and limitations of ductal pancreatic cancer treatment”, Professor Seufferlein (Halle) pointed out that pancreatic carcinoma has a very poor prognosis. The principal reasons for this, he said, are firstly the lateness with which the disease is diagnosed as a result of an absence of symptoms or the presence of only nonspecific symptoms, and secondly the resistance of the disease to radiotherapy and chemotherapy. Only complete resection – which is, however, rarely possible – offers a possibility of cure. In his talk, Professor Seufferlein dealt with subjects ranging from neoadjuvant, adjuvant and palliative therapies to new therapeutic strategies such as the use of CD40

agonists, which cause breakdown of tumour stroma and lysis of tumour cells by macrophages. He also referred to albumin-bound paclitaxel, which is used in the form of nanoparticles in combination with gemcitabine, and to the acquisition of more detailed knowledge of tumour subgroups, which it is hoped will improve the efficiency of treatment. The following observations apply only to adjuvant and palliative therapy settings. In Europe the standard treatment in the adjuvant therapy setting is chemotherapy alone. With this approach, the 5-year survival rate has been increased from 9 to 20 percent. Because of its lower toxicity, gemcitabine is preferred to bolus administration of 5-FU, although survival rates do not differ significantly between the two drugs. In the palliative setting, gemcitabine prolongs survival and relieves disease-related symptoms and signs such as pain and weight loss. The median survival time of patients with metastatic pancreatic carcinoma receiving this treatment is 6 to 7 months. Combination of gemcitabine with erlotinib, an EGF receptor tyrosine kinase inhibitor, improves this value (to 10.5 months) only in patients who show an (inflammatory) skin reaction in the first few weeks of treatment. Recently Conroy et al. showed that in patients with metastases, intensified chemotherapy in accordance with the FOLFIRINOX protocol increases median survival time to 11.1 months.

Dr. Matthes (Berlin) discussed the use of mistletoe therapy in adjuvant and palliative therapy settings. In patients with pancreatic carcinoma, mistletoe preparations are used subcutaneously (as an adjuvant to chemotherapy), intravenously and intratumorally in order to exploit the cytotoxic properties of mistletoe extracts. Dr. Matthes reported on a controlled, retrospective, multicentric, pharmacoepidemiological noninterventional cohort study in which 396 postoperative patients received conventional therapy with gemcitabine, while those patients in the mistletoe arm (n=201) also received Iscador Quercus subcutaneously. This led to an improvement in terms of quality of life, symptoms attributable to the disease and its treatment and overall survival in the mistletoe group as compared to the comparator group. In a phase I dose escalation study by Mansky et al. (Bethesda, USA), it was found that use of mistletoe therapy with Helixor A in combination with gemcitabine in patients with advanced solid tumours (n=44; pancreatic carcinoma n=10) was not only well tolerated, but also higher doses of gemcitabine (as recommended) were possible. The neutrophil granulocyte count and its minimum value during chemotherapy showed a mistletoe dose-depending increase. No influence whatsoever on the pharmacokinetics of the cytotoxic drug or on cytokine release was observed. Dr. Matthes also referred to smaller studies (Schad et al., Berlin) in which patients with inoperable pancreatic carcinoma were treated with intratumorally administered mistletoe preparations of a number of different manufacturers simultaneously with gemcitabine therapy. Overall survival time was subsequently found to be 12.2 months in patients in UICC stage III and 11.2 months in patients in UICC stage IV, with a one-year survival rate of 26 percent.

Outcome study data obtained by Dr. Spahn (monocentric integrative therapeutic approach = indication-dependent combination of conventional with anthroposophical therapy including mistletoe extract, in most cases Abnobaviscum; hyperthermia) complemented and confirmed these favourable results. The result was good tolerance of treatment with a median survival time of 15.2 months in all patients (n=95) and 12.4 months in patients with advanced disease (stages III and IV; n=60). It was thus shown that an integrative therapeutic approach involving use of mistletoe therapy leads to results which are at least comparable to those obtained with purely conventional therapy, but with better tolerance.

Last but not least, a randomised phase III study (Tröger, Freiburg; Iscador Qu spezial) in patients with advanced or metastatic pancreatic carcinoma was described in a poster. The initial analysis of the results of this study is to be performed shortly, so the papers to be delivered at the next Mistletoe Symposium (2015) will be eagerly awaited. Another phase III study, in this case in patients with superficial bladder carcinoma (Eisenbraun, Pforzheim; Abnobaviscum Fraxini), is currently in preparation. In addition, two prospective pharmaco-epidemiological studies on the use of Iscador Qu spezial in patients with colorectal carcinoma (800 patients) and pancreatic carcinoma (400 patients) are being conducted at present.

As the symposium came to an end, all participants agreed that it had been a great success, and the farewell words were “See you again in four years’ time in November 2015 at the 6th Mistletoe Symposium in Nonnweiler.”

The full texts of all contributions to the symposium are to be made available, presumably by the end of 2012, in the form of a book to be published by KVC Verlag Essen. Further information on this and on previous mistletoe symposia is available at www.mistelsymposium.de.

Dr. Rainer Scheer, Carl Gustav Carus-Institut, Am Eichhof 30, 75223 Niefern-Öschelbronn, Germany.

Presentations:

Gunver S. Kienle, Clinical research on mistletoe therapy in cancer – Status quo, current projects and developments.

Thomas Breitkreuz. State of the art and new developments of anthroposophic mistletoe therapy – Results from a series of expert conferences hosted by the German anthroposophic doctor's association (GAAeD) 2008–2011.

M. Werner *et al*. Supportive therapy with mistletoe extract in tumor patients – Results of four controlled pharmacoepidemiological cohort studies as basis for prospective studies.

Jürgen Johannes Kuehn. Different routes of application in mistletoe therapy – Effect on bone marrow and blood profile. Clinical significance.

R. Ziegler *et al.* Mistletoe therapy in anthroposophical hospitals in Switzerland.

H. Matthes *et al*. Mistletoe therapy in adjuvant and palliative therapy of pancreatic carcinoma: Concepts–facts–perspectives.

P.J. Mansky *et al*. NCCAM/NCI phase 1 study of mistletoe extract and Gemcitabine in patients with advanced solid tumors.

M. Brandenberger *et al.* Quality of life during mistletoe therapy of cancer patients – An exploratory study with the additional use of questionnaires,

Wilfried Tröger, Mistletoe therapy for advanced pancreatic cancer. A group-sequential, randomised, open label study phase III ISRCTN 70760582.

K.R. Wiebelitz and A.-M. Beer. High dose intravenous mistletoe treatment – Clinical results, laboratory findings and adverse events in a series of 17 patients with 107 intravenous applications.

Jürgen Eisenbraun. Dose-escalation-study with a mistletoe extract from the ash tree as intravesical instillation in patients with superficial bladder cancer: An ICH/GCP phase Ib/IIa study.

M. Orange *et al*. Two cases of durable regression of primary B-cell cutaneous lymphoma following mistletoe treatment alone.

C.M. Strüh *et al*. Amplification of anti-melanoma activity of mistletoe extracts by enrichment with solubilized triterpene acids.

A. Dahl *et al.* Aqueous mistletoe extracts versus purified mistletoe lectin-I (pML-I): Effects on melanoma growth and spread in a human melanoma xenograft scid mouse model.

J. Burkhart *et al*. The potential of a mistletoe (*Viscum album* L.) extract to alleviate adverse effects of cancer chemotherapy: An in vitro study.

W. Blaschek *et al*. Localization of mistletoe lectins ML I-III in *Viscum album* L. by immunofluorescent and immunogold labeling.

T. Ostermann and A. Büssing. Retrolective studies on the survival of cancer patients treated with mistletoe extracts – A meta analysis.

Y. Klapper *et al*. Interactions between proteins of mistletoe or human serum and lipid membranes.

M. Kröz *et al*. Mistletoe and chemotherapy responsiveness of different scales in oncological patients undergoing chemotherapy.

U. Mengs *et al.* Lectins are the pharmacologically active constituents in the standardized mistletoe extract PS76A2 (Lektinol®).

M. Kröz *et al*. State version of autonomic regulation (aR): A new scale to distinguish between autonomic constitution and loss of regulation with regards to chemo- and mistletoe sensitivity.

U. Pfüller and U. Schumacher. Mistletoe lectins as biologically active substances in aqueous mistletoe extracts.

W.F. Eisenbeiß *et al.* Selective quantification of mistletoe lectin I in pressed mistletoe juice after inhibition of mistletoe lectin II and III.

Stefan Seegmüller. Viscotoxin 1-PS from Scots pine mistletoe– Ecophysiological Hints.

Mira Kohl *et al.* Comparative investigation of monosaccharides and sugar alcohols in mistletoes (*Viscum album* L.) from different host trees.

J. Doehmer and J. Eisenbraun. Assessment of extracts from mistletoe (*Viscum album*) for herb–drug interaction by inhibition and induction of cytochrome P450 activities.

C. Werner *et al.* of the summary of product characteristic of anthroposophic preparations in parenteral dosage forms containing mistletoe – Result of a compromise between the marketing authorization holders and the German Federal Institute for Drugs and Medical Devices.

U. Pfüller and K. Pfüller. Selective inactivation of the B-subunit of mistletoe lectins and other RIP-II-lectins in ionic liquids.

G. Spahn *et al.* Clinical outcome study in pancreatic carcinoma using *Viscum album* therapy in an integrative approach.

Thomas Efferth. Molecular approaches for individualized tumor therapy with standard drugs, phytochemicals, and medicinal herbs.

T.J. Zuzak *et al*. *Viscum album* inhibits cell growth, migration and invasion of pediatric tumor cell lines – But effects are limited at concentrations found in serum.

U. Biegel *et al.* Orally administered *Viscum album* Quercus dilutions in the therapy of feline fibrosarcoma in cats.

J. Gutsch *et al*. Observational study on treatment of lymphocytic Non Hodgkin's Lymphoma (CLL) with *Viscum album* products Helixor P or A: Clinical course and safety.

O. Christen-Clottu *et al.* A randomized placebo controlled study on *Viscum album* (Iscador P) treatment of Equine Sarcoids in horses.

Boris Müller-Hübenthal. An online documentation for specific courses of therapy in oncology: www.bestcase-oncology.com.
Wolfgang Kreis. Lectins – Potential sources and potential benefits.
Christian Grah *et al.* Randomised, open phase II study of tolerance, safety and efficacy of *Viscum album* extract in the palliative, additive treatment of advanced non-small cell lung carcinoma (NSCLC).
Catharina I. Delebinski *et al.* Effects of *Viscum album* L. extracts in neuroblastoma in vitro and in vivo.
Catharina I. Delebinski *et al.* Therapeutic efficacy of natural compounds from *Viscum album* L. in acute lymphoblastic leukaemia.
M. Kröz *et al.* State version of autonomic regulation (aR): A new scale to distinguish between autonomic constitution and loss of regulation with regards to chemo- and mistletoe sensitivity.
Thomas Seufferlein. Options and limitations of ductal pancreatic cancer treatment.
A. Staudt *et al.* Diurnal cortisol profile in breast cancer patients before and during treatment with *Viscum album* (Iscador® P) for 3 or 6 months.
A. Longhi *et al.* *Viscum album* fermentatum Pini versus oral Etoposide as adjuvant treatment in osteosarcoma patients after second relapse.
F. Schad *et al.* Multimodal *Viscum album* L. treatment in an integrative oncological setting in patients with advanced pancreatic carcinoma.
C. Kunz *et al.* Treatment of basal cell carcinoma with *Viscum album* lipophilic extract – A case series study.
Gunver S. Kienle *et al.* Safety of higher dosages of *Viscum album* L. in animals and humans – Systematic review of immune changes and safety parameters.
K. Urech *et al.* Organ specific and seasonal accumulation of viscotoxin-isoforms in *Viscum album* ssp. *album.*
M. Vranceanu and G. Leneweit. Genuine bilayer formation during glancing impact of drops on liquid surfaces both covered by lipid monolayers.
A.P. Simões-Wüst *et al.* Sensitivity of primary cultures of breast cancer cells to different Iscador®-preparations.
Reinhild Klein. The role of inflammation in the pathogenesis of cancer.
S. Jäger *et al.* Cyclodextrin solubilised triterpene extracts show anti-tumorigenic effects on B16.F10 melanoma cells in vitro.
(http://www.sciencedirect.com/science/article/pii/S09447 11311004181)
C.v. Hagens *et al.* Does a treatment with *Viscum album* (Iscador® P) in patients with breast cancer influence the expression of the T-cell receptor (TCR)-zeta chains of T- and NK-cells?.
Shao Kang Hung *et al.* Case reports of adverse effects of herbal medicinal products (HMPs): A quality assessment,
U. Weissenstein *et al.* Effect of *Viscum album* lipohilic extract on human immunocompetent cells in vitro.
Rainer Scheer. Editorial.
(www.sciencedirect.com/science/article/pii/S094471 1311002637)

FORTHCOMING MEETINGS

The VIth International Weed Science Congress (IWSC) will be held on June 17 to 22, 2012 at the New Century Grand Hotel in Hangzhou, China.The theme of the Congress is **'**Dynamic weeds – diverse solutions' and will include a session on Parasitic Weeds on June 21st and there will be a further Symposium 'The State of art in Parasitic Plants Research in the Technological and Biotechnological Era' on June 22nd. For information on these sessions, contacts are:
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Deadline for early registration is March 1. The fee will increase thedreafter.

N.B. Active members pay a discounted fee for the Congress, will have voting privileges for the election of officers, and will have members-only access to abstracts for the first two years after the Congress.You are advised to renew your membership to IWSS via http://www.olemiss.edu/orgs/iws/DEFAULT.htm .

BOOKS

Parker and Riches, 1993. Parasitic Weeds of the World: Biology and Control. Wallingford, UK: CABI.

This has been out of print for some years and the co-authors regrettably declined invitations to prepare a revised edition (we couldn't quite face it!). Now CABI have decided to re-issue on a 'print-on-demand' basis. The price is not yet available but is expected to be in the

range £75-£95. Sadly it has not been possible to correct any of the embarrasing errors in the original.

Chris Parker.

THESES

Muhammad Jamil (PhD Thesis, Wageningen University, Wageningen, The Netherlands, 2011.) **The relationship between strigolactones and *Striga hermonthica* infection in cereals.** With summaries in English, Dutch and Urdu, 192 pp.

Cereal production in Africa is under increasing constraint due to the obligate, out-crossing, hemiparasitic weed *Striga hermonthica* (Del.) Benth, a member of the Scrophulariaceae family. *Striga* parasitizes roots of cereals like sorghum, pearl millet, maize and upland rice. It has infested about 40% of the African agricultural land, resulting in severe yield losses or even complete crop failure worth US$7 billion per annum. The subsistence farmers or approximately 300 million African people lose about 20-80% of their crop because of this weed. This considerable damage by *Striga* is due to the fact that existing control measures are often ineffective. These include cultural and mechanical measures, such as hand pulling, that are mainly adopted after its emergence. Since much of the damage occurs underground during the early stages of parasitism, there is a need to develop control strategies that target the weed prior to attachment and emergence. A crucial step in the lifecycle of *Striga* is the induction of germination by strigolactones, signalling molecules secreted by the roots of its host. These strigolactones could be an important target to control this weed at the pre attachment phase. Control methods targeted at the germination and attachment phase, based on low strigolactones, might prove to be more effective and result in reduced infestation of this weed in cereal crops. In my thesis we studied the relationship between strigolactones and *Striga* infection in cereals and explored opportunities for lowering *Striga* damage at the germination or attachment phase. To this end different aspects like strigolactone biosynthetic inhibitors, genetic variation for strigolactone production, and the effect of fertilizers on strigolactone production were investigated in laboratory studies and – when possible - in the field in Kenya and Mali.

The first investigation was on the use of carotenoid inhibitors to see the possibilities of strigolactone reduction in the roots of plants by blocking carotenoid biosynthesis. We postulated in this study that the (mild) inhibition of carotenoid biosynthesis by carotenoid inhibitors, could lead to a reduced production of strigolactones and decreased *Striga* germination and infection. Very low concentrations of four different carotenoid inhibitors (fluridone, norflurazon, clomazone and amitrole) were applied to rice either through irrigation or through foliar spray. Irrigation application of all carotenoid inhibitors and spray application of amitrole significantly decreased strigolactone production. A significant negative relationship between inhibitor concentration and *Striga* germination and attachment was noted for irrigation application of fluridone, clomazone and norflurazon while amitrole application showed significance only in *Striga* germination. Application of carotenoid inhibitors caused 61-75% reduction in *Striga* germination and 65-94% reduction in *Striga* attachment. The study shows that the reducing effect of carotenoid inhibitors (which, in much higher concentrations are widely used as herbicides) on strigolactone secretion and subsequent *Striga* germination and attachment may be developed into an attractive *Striga* control technology.

Another experiment (Chapter 3) was aimed at assessing the pre-attachment *Striga* resistance based on low strigolactone production. We hypothesized that low strigolactones producing crop cultivars might possess pre-attachment *Striga* resistance due to less germination. For this purpose a set of 18 upland cultivars of NERICA and their parentswere screened for strigolactones production and *Striga* infection parameters like germination, attachment, emergence and *Striga* dry biomass. NERICA 1 and CG14 produced significantly less strigolactones and showed less *Striga* infection while NERICAs 7, 8, 11 and 14 produced the highest amounts of strigolactones and showed the most severe *Striga* infection. A positive relationship between the amount of strigolactones and *Striga* infection was seenamong the rice cultivars. This study shows that genetic variation for pre-attachment *Striga* resistance exists in NERICA rice due to variation in strigolactones. This could be highly relevant for breeding programs aimed at the development of *Striga* resistant cultivars.

In Chapter 4 we hypothesized that variation in strigolactone production in rice might be interconnected with the tillering phenotype and that this link could affect *Striga* infection. In this study the genetic variation was tested in a series of rice varieties collected from all over the world for strigolactone production, tillering phenotype and *Striga* infection. Rice cultivars like IAC 165, IAC 1246, Gangweondo and Kinko produced high amounts of the strigolactones, displayed low amounts of tillers and induced high *Striga* germination, attachment, emergence as well as *Striga* biomass. In contrast to this, rice cultivars such as Super Basmati, TN 1, Anakila and Agee showed low production of strigolactones and also low *Striga* germination and infection but high tillering. Statistical analysis across all the varieties confirmed a strong positive correlation between strigolactone production and *Striga* infection and a negative

relationship with tillering. These results show that genetic variation in strigolactone production results in variation in tillering and also in *Striga* infection. The tillering phenotype could possibly be used as an easy indicator of the strigolactone production in a breeding programme for *Striga* resistance.

A number of experiments (Chapters 5, 6, 7) were designed with the aim to quantify the relationship between strigolactones and *Striga* germination and attachment and to explore the mechanism responsible for the reported reduction in *Striga* parasitism in the field after fertilizer application. We hypothesized that a better mineral nutrient supply reduces *Striga* infection by reducing strigolactone exudation into the rhizosphere. Different levels of nitrogen and phosphorous were applied under greenhouse conditions using rice, maize and sorghum. For maize and sorghum, a parallel study was carried out under field conditions in Kenya and Mali to study the translation of greenhouse results to the field. Application of N and P effectively suppressed *Striga* infection in the greenhouse in all three crop species and the reduction strongly correlated with reduced secretion of strigolactones into the rhizosphere and the *Striga* germination induced by these exudates. Production of strigolactones also differed strongly between crop cultivars. Rice *cv* IAC 165 produced about 100-fold higher amounts of 2'-epi-5-deoxystrigol, orobanchol and three new strigolactones than TN 1. Although the field results with maize in Kenya were less consistent than in the greenhouse, aespecially with respect to P effect, still there was a trend that fertilizer application reduced *Striga* infection. Microdosing of diammonium phosphate fertilizer in sorghum in the field in Mali also showed considerable *Striga* suppression which correlated with the results on strigolactone production and *Striga* infection in the greenhouse. These results show that the positive effect of fertilizer against *Striga* is at least partly due to a reduction in strigolactone production and as a consequence of that lower *Striga* germination and subsequent attachment. However, further research to optimize field application of fertilizers for *Striga* is needed.

Overall it can be concluded that there is a good correlation between strigolactones and *Striga* germination, attachment and biomass. We found this using strigolactone biosynthesis inhibitors, genetic variation and using fertilizer application. These technologies can hence be exploited as an important tool to target *Striga* at a very early phase of its life cycle. The practical field application of these strategies requires further research but could lead to effective *Striga* control components that can be used in Integrated *Striga* Management.

W. Kohlen, (PhD Thesis. Wageningen University, Wageningen, Netherlands, 2011). **Regulation of biosysnthesis and transport of strigolactones and their effect on plant development.** 192 pp.

Strigolactones are carotenoid derived signaling molecules initially identified as germination stimulants for root parasites of the Orobanchaceae family and pre-symbiotic signal for arbuscular mycorrhiza (AM). They have been identified in the root extracts and exudates of many plant species. Recently, strigolactones – or their derivatives – were identified to be the branch inhibiting signal. This elusive signal is graft transmissible and originating - partly - from the root system. However, the exact origin of strigolactones in the shoot is unknown. Nevertheless, it is likely that strigolactones are transported to the shoot where they exert their shoot branching inhibiting effect in concert with auxin and cytokinins. However, reports of strigolactones in aerial parts of the plant are scarce.

Strigolactone biosynthesis is not fully elucidated. An unknown carotenoid substrate is sequentially cleaved by CAROTENOID CLEAVAGE DIOXYGENASE 7 (CCD7) and CAROTENOID CLEAVAGE DIOXYGENASE 8 (CCD8). In addition to this, two enzymes MORE AXILLARY GROWTH 1 and DWARF 27 are also involved in strigolactone biosynthesis. However, their precise role in strigolactone biosynthesis remains unknown.

In Chapter 1, the root parasitic plants of the Orobanchaceae family and the problems they cause in agriculture are introduced. Furthermore, the role of strigolactones in the root parasite lifecycle as well as in AM symbiosis are addressed. In addition, the recently discovered strigolactone role in shoot architecture, their biosynthesis, hormonal signaling and the two theories on how strigolactones might be integrated into the apical dominance are described.

The first genuine strigolactone derived form the strigolactone biosynthetic pathway is thought to be 5-deoxystrigol. This strigolactone is postulated to be the precursor for all known strigolactones, which are believed to be derived from this compound through a number of different enzymatic and/or non-enzymatic steps. In Chapter 2, the biosynthesis of solanacol in the roots of tomato (*Solanum lycopersicum)* is described. This strigolactone contains an aromatic A-ring and therefore its biosynthesis from the precursor 5-deoxystrigol is not obvious. On the basis of the presence of other strigolactones in tomato (orobanchol, orobanchyl acetate, two 7-hydroxy-orobanchol isomers, 7-oxo-orobanchol and four didehydro-orobanchol isomers) we postulate how solanacol can be derived

from 5-deoxystrigol through a series of enzymatic hydroxylation-dehydroxylation reactions with migration of a methyl group and the introduction of double bonds.

In Chapter 3 we report the cloning of a tomato *CAROTENOID CLEAVAGE DIOXYGENASE 8* (*SlCCD8*) and demonstrate that reduction of its expression leads to reduced strigolactone levels in root extracts, exudates and xylem sap. All lines display excessive lateral shoot branching, reduced plant height and increased numbers of nodes. We show that the severity of these phenotypes correlates with the level of orobanchol present in tomato xylem sap. Furthermore, we demonstrate that a mild reduction in strigolactone biosynthesis and concomitant secretion into the rhizosphere is sufficient to reduce root parasitism by *Phelipanche ramosa* by about 90% without compromising apical dominance or AM symbiosis establishment too much. We also report additional phenotypes in tomato reproductive development (such as smaller flowers, fruits and seeds) - normally associated with reduced auxin levels – to be present in these strigolactone-deficient transgenic lines. We demonstrate decreased levels of free auxin in these organs, indicating that these phenotypes might be the consequence of the removal of the down-regulating effect of strigolactones on auxin levels.

In addition to strigolactones, the - well described - phytohormone abscisic acid (ABA) is also derived from the carotenoid pathway. Earlier results in our group indicated that a mutation in 9-*cis*-epoxycarotenoid dioxygenase (NCED) - an enzyme involved in ABA-biosynthesis - results in lower strigolactone levels. For this reason we investigated the relationship between ABA and strigolactones. Our findings are reported in **chapter 4**. We demonstrate that the carotenoid cleavage dioxygenase (CCD) inhibitor D2 reduces strigolactone but not ABA content of roots. However, in plants treated with abamineSG - an inhibitor of 9-*cis*-epoxycarotenoid dioxygenase (NCED) - and in the ABA mutants *Notabilis*, *Sitiens* and *Flacca* (mutants in two different enzymatic steps in ABA biosynthesis), both ABA and strigolactone levels were strongly reduced. Our results indicate a correlation between ABA levels and strigolactone biosynthesis, and suggest a role for ABA in the regulation of strigolactone biosynthesis.

In Chapter 5 the role of two GRAS-type transcription factors (NSP1 and NSP2) in the regulation of strigolactone biosynthesis is assessed. In legumes these transcription factors are essential for *Rhizobium* Nod factor induced nodulation. In this chapter we show that NSP1 and NSP2 are required for strigolactone biosynthesis in *Medicago truncatula* and rice. Hereto we have developed *M. truncatula* as a model for strigolactone analysis and identified its strigolactone composition to consist of didehydro-orobanchol (major) and orobanchol (minor). With this work we identify for the first time transcription factors that are regulating strigolactone biosynthesis. We demonstrate that NSP1 functions in strigolactone biosynthesis by regulating *DWARF27* expression. Our *in vitro* binding studies indicate that *MtDWARF27* is a primary target of MtNSP1. We also demonstrate that MtNSP2 is essential for conversion of orobanchol into didehydro-orobanchol. *NSP1* and *NSP2* are single copy genes in legumes, implying that the proteins they encode fulfill dual regulatory functions of different downstream targets: symbiotic and non-symbiotic. Since NSP1 and NSP2 are required for strigolactone biosynthesis in rice as well as Medicago and these two species represent distinct phylogenetic lineages that split ~150 million years ago, we postulate that regulation of strigolactone biosynthesis by NSP1 and NSP2 is an ancestral function conserved in higher plants.

In Chapter 6 strigolactone biosynthesis is assessed using *Arabidopsis thaliana* as a model. Strict control of environmental conditions and optimization of analytical protocols for strigolactone analysis enabled the detection of orobanchol, orobanchyl acetate and 5-deoxystrigol in Arabidopsis. In this chapter we demonstrate that the relation between phosphate starvation and the up-regulation of strigolactone biosynthesis is also present in this non AM species. Most land plants are mycorrhizal, which is believed to be the ancestral condition. Hence lack of AM symbiosis in Arabidopsis is likely to be a derived trait. We postulate that strigolactone exudation into the rhizosphere is a relic of this ancestral trait lost by Arabidopsis. However, our data show that strigolactone up-regulation in Arabidopsis under phosphorus deficient conditions serves to restrict the outgrowth of lateral shoot branches. We postulate that this represents an evolutionary advantage which could be the new driving force for the preservation of low phosphate induced strigolactone biosynthesis, as AM colonization no longer is in Arabidopsis. We demonstrate that orobanchol is transported through the xylem sap and that its concentration is elevated under phosphorus deficient conditions and we provide analytical evidence that MAX1 is required for orobanchol biosynthesis.

Recently, a novel function for strigolactones in the regulation of root system architecture (RSA) of tomato and Arabidopsis has been discovered. In Chapter 7 we show that reduced strigolactone biosynthesis or perception - as displayed by the *max1,2,4* mutants - leads to a reduction in the length of the primary root meristem. We demonstrate that application of the synthetic strigolactone analog GR24 is able to rescue this

phenotype in all max mutants except the strigolactone insensitive mutant, *max2*. Furthermore - when grown under sufficient phosphate conditions - GR24 application reduces the amount of lateral roots (LR) - arresting their development at phase five of lateral root primordia (LRP) initiation. We also show that higher concentrations of GR24 blocked LRP initiation completely and caused the primary root meristem to collapse. However, when GR24 application is accompanied by exogenous application of NAA, it has a stimulatory effect on lateral root development and outgrowth. Similarly, under phosphate-limiting conditions, up-regulation of endogenous strigolactones (**chapter 6**) present in wild type plants stimulated a more rapid outgrowth of lateral root primordia when compared with strigolactone-deficient mutants. In addition, we demonstrate that – under sufficient phosphate conditions - GR24 application to the root system of Arabidopsis leads to reduced auxin concentrations in the leaves. Combined, these results suggest that strigolactones are modulating local auxin gradients and hence influence changes in root architecture. Therefore, the net result of strigolactone action on root development depends on the auxin status of the plant. We postulate that a tightly balanced auxin-strigolactone interaction is the basis for the mechanism by which plants regulate their root to shoot ratio for example under phosphate limited conditions.

In Chapter 8 we summarize and discuss the most important results obtained from the work presented in this thesis and integrate these into the current knowledge on strigolactones, both as a plant hormone as well as rhizosphere signaling molecule. In this chapter we also consider the future perspectives of strigolactone research, especially related to the root parasitic weed problem.

GENERAL WEB SITES

For individual web-site papers and reports see LITERATURE

For information on the International Parasitic Plant Society, current issue of Haustorium, etc. see: http://www.parasiticplants.org/

For past and current issues of Haustorium see also: http://www.odu.edu/~lmusselm/haustorium/index.shtml

For the ODU parasitic plant site see: http://www.odu.edu/~lmusselm/plant/parasitic/index.php

For Dan Nickrent's 'The Parasitic Plant Connection' see: http://www.parasiticplants.siu.edu/

For the Parasitic Plant Genome Project (PPGP) see: http://ppgp.huck.psu.edu/

For information on the EU COST 849 Project (now completed) and reports of its meetings see: http://cost849.ba.cnr.it/

For information on the EWRS Working Group 'Parasitic weeds' see: http://www.ewrs.org/parasitic_weeds.asp

For a description and other information about the *Desmodium* technique for *Striga* suppression, see: http://www.push-pull.net/

For The Mistletoe Center (including a comprehensive Annotated Bibliography on mistletoes, up to 2005) see: http://www.rmrs.nau.edu/mistletoe/

For information on the 11th World Congress on Parasitic Plants in Martina Franca, Italy, June 2011, see: http://ipps2011.ba.cnr.it

For the work of Forest Products Commission (FPC) on sandalwood, see: http://www.fpc.wa.gov.au (Search *Santalum*)

For past and future issues of the Sandalwood Research Newsletter, see: http://www.jcu.edu.au/mbil/srn/index.html

For information on the work of the African Agricultural Technology Foundation (AATF) on *Striga* control in Kenya, including periodical 'Strides in *Striga* management' newsletters, see: http://www.aatf-africa.org/

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Birschwilks, M., Sauer, N., Scheel, D. and Neumann, S. 2007. *Arabidopsis thaliana* is a susceptible host plant

for the holoparasite *Cuscuta* spec. Planta 226(5): 1231-1241.

Bolin, J., Maas, E. and Musselman, L.J. 2011. A new species of *Hydnora* (Hydnoraceae) from Southern Africa. Systematic Botany 36(2): 255-260. [Distinctly longer tepal lobes and the largest flower metrics in the section *Euhydnora* distinguish *H. visseri* (named in honour of the late Johann Visser – see item above, including picture) from *H. africana* and *Hydnora longicollis.* At one known site where *H. africana* and *H. visseri* occur in sympatry, differences in flowering phenology and host preference appear to reinforce species boundaries.]

Bonfante, P., Requena, N., Oldroyd, G.E.D. and Robatzek, S. 2011. Dating in the dark: how roots respond to fungal signals to establish arbuscular mycorrhizal symbiosis. Current Opinion in Plant Biology 14(4): 451-457. [Review on the exchange of signalling molecules between host plants and arbuscular mycorrhizal fungi, dealing with factors released by the host - including strigolactones - as well as compounds produced by the fungus that induce the symbiotic modus of the plant.]

Boukhris-Bouhachem, S., Youssef, S.B. and Kharrat, M. 2011. First report of *Geoica utricularia* (Hemiptera: Aphididae) population on parasitic broomrape *Orobanche foetida*. Florida Entomologist 94(2): 343-344. [In Tunisia.]

Brand, J.E. and Pronk, G.M. 2011. Influence of age on sandalwood (*Santalum spicatum*) oil content within different wood grades from five plantations in Western Australia. Australian Forestry 74(2): 141-148. [Results indicate that to obtain a large proportion of high-grade wood from sandalwood plantations the stand age may have to be at least 25 years.]

Briggs, J. 2011. Mistletoe – a review of its distribution, conservation and insect associates. British Wildlife 23(1): 23-31. [An in-depth review of the status of *Viscum album* in UK and its apparent decline in some areas associated with decline of its favoured host apple, but tendency to increase in others, perhaps related to birds and/or climate. Other main hosts include lime, hawthorn and poplar. Also recording two new associated insects - a weevil *Ixapion variegatum* and a mirid bug, *Hypseloecus visci.*]

Bruschi, P., Morganti, M., Mancini, M. and Signorini, M.A. 2011. Traditional healers and laypeople: a qualitative and quantitative approach to local knowledge on medicinal plants in Muda (Mozambique). Journal of Ethnopharmacology 138(2): 543-563. [Of 162 species with traditional medicinal use in Mozambique the species with highest 'Cultural Importance index' is *Ximenia caffra* (Ximeniaceae). (= *Ximenia americana* var. *caffra*)]

Burns, A.E., Cunningham, S.A. and Watson, D.M. 2011. Arthropod assemblages in tree canopies: a comparison of orders on box mistletoe (*Amyema miquelii*) and its host eucalypts. Australian Journal of Entomology 50(3): 221-230. [Arthropod populations were higher on 3 *Eucalyptus* hosts than on *A. miquelii* perhaps due to higher N content in the host.]

Byamukama, R., Jordheim, M., Kiremire, B.T. and Andersen, Ø.M. 2011. Primitive anthocyanin from flowers of three hemiparasitic African mistletoes. Archives of Applied Science Research 3(3): 1-5. [Anthocyanins from the flowers of *Tapinanthus buvumae*, *T. constrictiflorus* and *Phragmanthera usuiensis* shown to be mainly cyanidin 3-O-β-glucopyranoside, comparable to those from *Cynomorium coccineum* and *Cassytha* spp.]

Cao Lin, Xiao ZhiShu, Guo Cong and Chen Jin. 2011. Scatter-hoarding rodents as secondary seed dispersers of a frugivore-dispersed tree *Scleropyrum wallichianum* in a defaunated Xishuangbanna tropical forest, China. Integrative Zoology 6(3): 227-234. [Scatter-hoarding rodents can play a significant role in maintaining seedling establishment of *S. wallichianum* (Santalaceae) and are able to at least partly compensate for the loss of large frugivorous vertebrates in seed dispersal.]

Cardoso, L.J.T., Alves, R.J.V. and Braga, J.M.A.. 2011. A new species and a key for *Langsdorffia* (Balanophoraceae). Systematic Botany 36(2): 424-427. [*L. heterotepala* was first collected in 1996 and is now confirmed as distinct from *L. hypogaea* - see news item above.]

Cazzonelli, C.I. 2011. Carotenoids in nature: insights from plants and beyond. Functional Plant Biology 38(11): 833-847. [Reviewing the creation of functional analogs and inhibitors of plant hormones with examples of brassinosteroids, ABA biosynthesis inhibitors and regulators of strigolactone function: SL mimics, SL biosynthesis inhibitor and SL biosynthesis regulation through gibberellin.]

C´ebovic´, T., Popovic´, M., Lepojevic´, Ž. and Mimica-Dukic´, N. 2008. Phytochemical analysis of non-polar extract from *Viscum album* L. Proceedings of the Fifth Conference on Medicinal and Aromatic Plants of Southeast European Countries, (5th CMAPSEEC), Brno, Czech Republic, 2-5 September, 2008, p. 152, 156. [Showing the presence of new terpene molecules: sesquiterpene trans-α-bergamotene, trans-β-farnesene, lactone loliolide and vomifoliol.]

C´ebovic´, T., Popovic´, M. and Spasic´, S. 2008. Evaluation of the cytotoxic and antioxidant effects of.some terpene derivatives from *Viscum album* L. extract. Proceedings of the Fifth Conference on Medicinal and Aromatic Plants of Southeast European Countries, (5th CMAPSEEC), Brno, Czech Republic, 2-5 September, 2008, p 51. [Significant

effects shown against EAC breast carcinoma cells *in vivo*.]

Chak, W.H., Tennakoon, K.U., and Musselman, L.J. 2010. The first report of angiosperm parasitic genus *Cuscuta* (dodder) in Brunei Darussalam: A mystifying existence. Folia Malaysiana **11**(1): 13-24. [Recording *C. australis*, flowering, on *Mikania micrantha*, and many non-flowering *Cuscuta* populations, since confirmed as *C. australis* – see item in text above.]

Chen, H., Shen, H., Ye, W., Cao, H. and Wang, Z. 2011. Involvement of ABA in reduced photosynthesis and stomatal conductance in *Cuscuta campestris* - *Mikania micrantha* association. Biologia Plantarum 55(3): 545-548. [Results suggest that an increase in ABA concentration caused by *C. campetris* contributes to reduced stomatal conductance, transpiration rate and net photosynthetic rate in the host *M. micrantha.*]

Chen QingLiang Jia YaMin, Wang ZhiFen, Shan ChengGang, Zhu JingBin and Guo YuHai. 2011. Postembryonic development of *Cistanche tubulosa* (Schrenk) Whigt. Pakistan Journal of Botany, 2011, 43, 4, 1823-1830. [The anatomy of seed development in this species is similar to that reported for other members of the family with a very reduced embryo.]

Chen SuHong, Lv GuiYuan, Fan Jing, Yan MeiQiu, Shan LeTian, Fang Zhe, Li HengHui, Su Jie and Li Wei. 2011. Therapeutic effect of petroleum ether extract from *Semen cuscutae* against β-estradiol 3-benzoate induced kidney-yang deficiency in mice. African Journal of Pharmacy and Pharmacology 5(6): 700-705. [Reporting significant alleviation of induced kidney-yang symptoms in mice by an extract of *Cuscuta* sp.]

Chen Tao, Du CaiGan and Linghua RongXing. 2010. Medicinal herbs for the management of desertification. Journal of Agriculture, Biotechnology and Ecology 3(2): 124-132. [*Cistanche deserticola* among the species referred to with potential for increased exploitation as a means of conserving desert habitats in China.]

Chen Zhe, Zhou HuaKun, Zhao XinQuan, Wen Jun, Ye Xin and Yu Long. 2011. Resource allocation of *Pedicularis kansuensis* of artificial grassland with different planting dates in three rivers' source regions in Qinghai, China. Acta Botanica Boreali-Occidentalia Sinica 31(5): 995-1002.

Chhabra, S., Thakral, J., Kamboj, P. and Paliwal, Y. 2010. Comparative evaluation of antimicrobial potential of different extracts of *Cuscuta reflexa* growing on *Acacia arabica* and *Zizyphus jujuba*. Pharmacognosy Journal 2(9): 293-296. [Alcohol extracts of *C. reflexa* from both tree hosts were active against both gram positive and gram negative bacteria.]

Chirilă, F., Fit, N., Răpuntean, S., Nadăş, G. and Nistor, A.C. 2011. A study regarding the *Penibacillus larvae* strains sensitivity isolated from some counties in Transylvania to different antibiotics and vegetal essential oils. Cluj Veterinary Journal 19(1): 60-64. [Including the effects of an extract of *Rhinanthus* sp. on the bee pathogen *Paenibacillus larvae*.]

Chua HongBiao, Zeng GuangZhi, Zhu MeiJu, He WenJun, Zhang YuMei and Tan NingHua. 2011. Chemical constituents of *Pedicularis densispica* Franch. Zeitschrift für Naturforschung. B, Chemical Sciences 66(6): 641-646. [A range of new compounds identified from *P. densispica*. Bioactivity results indicate activity on PAI-1 antithrombus assay in vitro and antifatigue activities in vivo.]

Cissoko, M., Boisnard, A., Rodenburg, J., Press, M.C. and Scholes, J.D. 2011. New Rice for Africa (NERICA) cultivars exhibit different levels of post-attachment resistance against the parasitic weeds *Striga hermonthica* and *Striga asiatica*. New Phytologist 192(4): 952-963. [Across a range of cultivars of NERICA rices and their parents *Oryza sativa* and *O. glaberrima*, there was a positive relationship between the amount of strigolactones in the exudate and the germination of *S. hermonthica* and its attachment and emergence rates. Varieties NERICA 1 and CG14 showed greatest resistance.]

Colbach, N., Abdennebi-Abdemessed, N. and Gibot-Leclerc, S. 2010. Modelling the effects of cropping systems on the dynamics of a parasitic weed, *Phelipanche ramosa*, in interaction with the non-parasitic weed flora. 21ème Conférence du COLUMA. Journées Internationales sur la Lutte contre les Mauvaises Herbes, Dijon, France, 8-9 Décembre 2010: 311-320. [Describing the development of a model, PHERASYS, aimed at understanding the influence of different control measures, or lack of them, especially herbicide use, on populations of *P. ramosa* in oilsed rape.]

Costea, M., Ruiz, I.G. and Stefanovic´, S. 2011. Systematics of "horned" dodders: phylogenetic relationships, taxonomy, and two new species within the *Cuscuta chapalana* complex (Convolvulaceae). Botany 89(10): 715-730. [Presenting a taxonomic revision of the *C. chapalana* complex in Mexico and northern S. America, based on morphology, scanning electron microscopy, and DNA sequence data from plastids and nucleus, with an identification key, descriptions, and illustrations, including two new species *C. bonafortunae* and *C. carnosa*.]

Costea, M., Spence, I. and Stefanovic´, S. 2011. Systematics of *Cuscuta chinensis* species complex (subgenus *Grammica*, Convolvulaceae): evidence for long-distance dispersal and one new species. Organisms Diversity & Evolution 11(5): 373-386. [From a detailed study of the mainly N. American *C.*

chinensis species complex, it is concluded that *C. applanata* should be treated as a variety of *C. chinensis* while *C. alata*, previously considered synonymous to *C. applanata* is a distinct species; *C. potosina* var. *globifera* is now described as a new species, *C. azteca*. *C. chinensis* var. *chinensis* is exceptional in having an E. Asian distribution.]

Cuevas-Reyes, P., Fernandes, G.W., González-Rodríguez, A. and Pimenta, M. 2011. Effects of generalist and specialist parasitic plants (Loranthaceae) on the fluctuating asymmetry patterns of ruprestrian host plants. Basic and Applied Ecology 12(5): 449-455. [Noting a marked increase in leaf fluctuating asymmetry (a tendency for deviation from perfect symmetry, considered to be an indicator of stress) in *Erythroxylum suberosum* parasitised by *Phoradendron* cf. *amplexicaule* and lesser increases in three hosts of the generalist mistletoe *Struthanthus flexicaulis*. Hypothesising that specialized parasites could be more damaging to their hosts than generalist mistletoes.]

Dakskobler, I. 2011. (Novelties in the flora of the western Slovenija (Primorska). Ladnikia, Slovenia) (in Slovenian) 27: 3-25. [Including new sites for *Orobanche hederae*, *O. pancicii*, *Odontites luteus*, *Pedicularis hoermanniana* and *Rhinanthus rumelicus*.]

Dakskobler, I., Vreš, B. and Pusch, J. 2010. (*Orobanche pancicii* Beck, a new species to the flora of Slovenia.) (in Slovenian) Hacquetia 9(2): 171-176. [Describing localities and sites of *Orobanche pancicii*, a new species for Slovenia, recorded in the subalpine belt on the hosts *Knautia drymeia, K. longifolia* and *Scabiosa lucida*].

Dandopani Chatterjee, Sahu, R.K., Jha, A.K. and Jaya Dwivedi. 2011. Evaluation of antitumor activity of *Cuscuta reflexa* Roxb (Cuscutaceae) against Ehrlich Ascites Carcinoma in Swiss albino mice. Tropical Journal of Pharmaceutical Research 10(4): 447-454. [Extracts of *C. reflexa* exhibit significant antitumour activity in EAC-bearing mice that is comparable to that of the reference standard, 5-fluorouracil.]

Dani, K.G.S., Ravikumar, P., Kumar, R.P. and Kush, A. 2011. Genetic variation within and among small isolated populations of *Santalum album*. Biologia Plantarum 55(2): 323-326. [There are indications of clonality within the Indian sandalwood populations which can be attributed to habitat fragmentation, isolation and vegetative reproduction.]

Das, M.K., Sharma, R.S., Vandana Mishra. 2011. A cytotoxic type-2 ribosome inactivating protein (from leafless mistletoe) lacking sugar binding activity. International Journal of Biological Macromolecules 49(5): 1096-1103. [Studying Articulatin-D from *Viscum articulatum* growing on *Dalbergia* sp. In India.]

Delannoy, E., Fujii, S., Colas des Francs-Small, C., Brundrett, M. and Small, I. 2011. Rampant gene loss in the underground orchid *Rhizanthella gardneri* highlights evolutionary constraints on plastid genomes. Mol. Biol. Evol. 28: 2077-2086. [This amazing fully mycoheterotrophic orchid is one of the few subterranean angiosperms (*Hydnora triceps* is another). Its reduced plastome parallels situations seen in haustorial parasites such as *Epifagus*.]

Deng JengShyan, Chi ChuanSung, Huang ShyhShyun, Shie PeiHsin, Lin TsungHui and Huang GuanJhong. 2011. Antioxidant, analgesic, and anti-inflammatory activities of the ethanolic extracts of *Taxillus liquidambaricola*. Journal of Ethnopharmacology 137(3): 1161-1171. [*T. liquidambaricola* extracts demonstrated antioxidant, antinociceptive, and anti-inflammatory activity, supporting previous claims for their traditional use for inflammation and pain in Taiwan.]

Dibong, S.D. Mpondo, M.E. and Ngoye, A. 2011. Vulnerability of wild fruit species sold in the markets of Douala (Cameroon). Journal of Animal and Plant Sciences (JAPS) 11(3): 1435-1441. [*Olax subscorpioidea* among species regarded as 'vulnberable' and needing conservation.]

Doležal, J., Mazůrek, P. and Klimešová, J. 2010. Oak decline in southern Moravia: the association between climate change and early and late wood formation in oaks. Preslia 82(3): 289-306. [Noting that unfavourable climatic conditions cause attenuated trees to become prone to mistletoe (presumably *Viscum album*) which predispose oaks to damage or death.]

Domina, G. and Mazzola, P. 2011. Notes on the genus *Orobanche* in Italy: 3. Taxa described by A. Bertoloni. Plant Biosystems 145(2): 342-346. [Eleven of the 'new' species described by Bertoloni are re-ascribed to other species. Only *O. australis*, included by Beck in *O. canescens*, is a good species, restricted to Sardinia.]

Dong CunZhu, Wu QingZhao, Xu HanHong, Xie ChaoLiang and Wang Rui. 2011. (Insecticidal activity of the extracts from 40 species of plants in Hainan Island against *Musca domestica* Linaeus.) (in Chinese) Acta Agriculturae Universitatis Jiangxiensis 33(3): 476-481. [Including results from *Cassytha filiformis* but lack of mention in abstract suggests low activity.]

Dong SongLin, Zhang Yong, Chen NianLai, Li CaiXia and Gao HaiNing. 2011. Study on characteristics of seeds dormancy and germination of parasitic plant *Cynomorium songaricum* Rupr. Medicinal Plant 2(1): 1-4. [Germination of *C. songaricum* stimulated by roots of *Nitraria tangutorum*.]

Dongo, A., Leflon, M., Simier, P. and Delavault, P. 2012. Development of a high-throughput real-time

quantitative PCR method to detect and quantify contaminating seeds of *Phelipanche ramosa* and *Orobanche cumana* in crop seed lots. Weed Research 52(1): 34-41. [A novel approach to the specific detection and quantitatification of parasitic seeds in crop seed (or in soil) with very significant potential uses.]

Dor, E., Joel, D.M., Kapulnik, Y., Koltai, H. and Hershenhorn, J. 2011. The synthetic strigolactone GR24 influences the growth pattern of phytopathogenic fungi. Planta 234(2): 419-427. [The synthetic strigolactone GR24 induced *in vitro* hyphal branching in a number of plant pathogenic fungi such as *Sclerotinia sclerotiorum*, *Colletotrichum acutatum* and *Fusarium oxysporum* suggesting that strigolactones not only affect arbuscular mycorrhizal fungi and parasitic plants, but also have an effect on other fungi.]

Dowie, N.J., Hemenway, J.J., Trowbridge, S.M. and Miller, S.L. 2011. Mycobiont overlap between two mycoheterotrophic genera of Monotropoideae (*Pterospora andromedea* and *Sarcodes sanguinea*) found in the Greater Yellowstone Ecosystem. Symbiosis 54(1): 29-36. [The discovery of a new symbiont may provide evidence for an undiscovered lineage of *Pterospora andromedea* in the area. In addition, overlap in obligate mycobionts between closely related mycoheterotrophs provides interesting new information on the phylogenetic history and coevolution of the mycoheterotrophs in the Monotropoideae (Ericaceae).]

Draie, R., Péron, T., Pouvreau, J.B., Véronési, C., Jégou, S., Delavault, P., Thoiron, S. and Simier, P. 2011. Invertases involved in the development of the parasitic plant *Phelipanche ramosa*: characterization of the dominant soluble acid isoform, PrSAI1. Molecular Plant Pathology 12(7): 638-652. [Of 5 invertase isoforms identified in *P. ramosa*, PrSAI1 had the greatest expression in germinated seeds and throughout subsequent plant development. Its roles in parasite metabolism during independent growth and in maintaining osmotic potentials in mature plants are explored.]

Du XiaoLi, Huang Mei, Ma YueFeng, Guo ChengLin, Liang HaiBo, Tian Hong, Jiang XiuLi and Nong Gang. 2011. (Occurrence and growth dynamics of *Semen cuscutae* in gardens of Guangxi and evaluation of herbicides for its control.) (in Chinese) Journal of Southern Agriculture 42(7): 748-751. [Finding 6% bispyribac-sodium+sdp AS suitable for controlling *Cuscuta reflexa*, *C. japonica* and *C. australis* in gardens.]

Dugje, I.Y., Ekeleme, F., Kamara, A.Y., Menkir, A., Chikoye, D. and Omoigui, L.O. 2010. Field evaluation of sorghum varieties to *Striga hermonthica* infestation in north eastern Nigerian savannas. Nigerian Journal of Weed Science 23: 1-11. [Confirming previous indications of tolerance to *S. hermonthica* in sorghum variety KSV 8, and resistance in PSL985061, P9401 and P9402.]

Dugje, I.Y., Kamara, A.Y. and Ekeleme, F. 2010. Evaluation of farmers' crop production practices that determine *Striga gesnerioides* infestation of cowpea fields in Nigerian Savannas. Nigerian Journal of Weed Science 23: 12-24. [Concluding that *S. gesnerioides* infestations can be reduced by combining resistant cowpea variety (IT97K 499-35), adequate phosphorus fertilizer application, and rotation of cowpea with cereals.]

Dugje, I.Y., Kamara, A.Y. and Kwari, J.D. 2008. Analyses of soil physico chemical properties determining *Striga hermonthica* infestations and grain yield of maize (*Zea mays* L.) in Nigerian Guinea and Sudan Savannas. Nigerian Journal of Weed Science 21: 23-37. [Based on a survey of 98 fields, concluding that increased levels of soil organic matter and exchangeable bases will reduce *Striga* infestation and increase grain yield of maize.]

Dugje, I.Y., Kamara, A.Y. and Omoigui, L.O. 2011. Assessment of farmers' crop management practices influencing *Striga hermonthica* infestation and grain yield of sorghum (*Sorghum bicolor*). Nigerian Journal of Weed Science 20: 25-35. [A survey of 54 sorghum fields in NE Nigeria recorded benefits from sorghum-legume rotation, sorghum+legume intercropping and 3 hoe-weedings.]

Dwarka, A., Friedman, C.M.R., MacKay, M.E. and Nelson, D. 2011. Polymerase chain reaction identification of a female-specific genetic marker in *Arceuthobium americanum* (lodgepole pine dwarf mistletoe) and its implications for *Arceuthobium* sex determination. Botany 89(6): 369-377. [This study has generated an efficient molecular tool to differentiate male and female *A. americanum* while also indicating that *A. americanum* may have homomorphic, possibly protoheteromorphic, sex chromosomes.]

Ekeleme, F., Kamara, A.Y., Omoigui, L.O., Chikoye, D., Dugje, I.Y. and Tegbaru, A. 2011. Effect of sowing date on *Striga* infestation and yield of sorghum (*Sorghum bicolor* [L.] Moench) cultivars in the Sudan savanna of northeast Nigeria. African Journal of Agricultural Research 6(14): 3240-3246. [Evaluating the interaction of sowing date and sorghum variety using 3 improved varieties. KSV8 apparently has tolerance and performed best in spite of heavy *S. hermonthica* infestation when sown early. ICSV111 and ICSV400 gave highest yields when sown later.]

Elevitch, C.R. 2011. Specialty crops for Pacific Islands. Agroforestry Net, Inc., Hawaii, USA, 576 pp. [Including reference to *Santalum* spp.]

Ember, I., Acs, Z., Munyaneza, J.E., Crosslin, J.M. and Kolber, M. 2011. Survey and molecular detection of phytoplasmas associated with potato in Romania and southern Russia. European Journal of Plant Pathology 130(3): 367-377. [The phytoplasma 'Stolbur' ('*Candidatus Phytoplasma solani*'; 16SrXII-A) causes spongy potato tubers. Also present in *Cuscuta* sp.]

Emmanuel, T.V., Njoka, J.T., Catherine, L.W. and Lyaruu, H.V.M. 2011. Nutritive and anti-nutritive qualities of mostly preferred edible woody plants in selected drylands of Iringa District, Tanzania. Journal of Nutrition 10(8): 786-791. [Noting the use of *Opilia amentacea* as a vegetable.]

Eriksson, O. and Kainulainen, K. 2011. The evolutionary ecology of dust seeds. Perspectives in Plant Ecology, Evolution and Systematics 13(2): 73-87. [Discussing the evolution and significance of 'dust seeds' in Orobanchaceae and at least 11 other families, most being mycoheterotrophic, but this not being confirmed in Rubiaceae, Buddlejaceae and Gesneriaceae.]

Ermakov, N. and Makhatkov, I. 2011. Classification and ordination of north boreal light-coniferous forests of the West Siberian Plain. Plant Biosystems 145(Supplement): 199-207. [Including reference to the association of *Melampyrum pratense* with *Larix sibiricae*.]

Erukainure, O.L., Abovwe, J.A., Adefegha, A.S., Egwuche, R.U. and Fafunso, M.A. 2011. Antilipemic and hypocholesteremic activities of *Globimetula braunii* in rats. Experimental and Toxicologic Pathology 63(7/8): 657-661. [Confirming antilipemic and hypocholesteremic activities of *G. braunii* (Loranthaceae) in Nigeria.]

Evidente, A., Cimmino, A., Fernández-Aparicio, M., Rubiales, D., Andolfi, A. and Melck, D. 2011. Soyasapogenol B and *trans*-22-dehydrocam- pesterol from common vetch (*Vicia sativa* L.) root exudates stimulate broomrape seed germination. Pest Management Science 67(8): 1015-1022. [Soyasapogenol B stimulated the germination of *Orobanche minor* seeds only, whereas *trans*-22-dehydrocampesterol also stimulated *O. aegyptiaca*, *O. crenata* and *O. foetida*.]

Ewald, N.C., John, E.A. and Hartley, S.E. 2011. Responses of insect herbivores to sharing a host plant with a hemiparasite: impacts on preference and performance differ with feeding guild. Ecological Entomology 36(5): 596-604. [Sap-sucking aphid and spittle bug preferred to feed on *Holcus lanatus* parasitized by *Rhinanthus minor* than on un-parasitised plants, and the aphid benefited, but a grasshopper showed no such preference.]

Fadini, R.F. 2011. Non-overlap of hosts used by three congeneric and sympatric loranthaceous mistletoe species in an Amazonian savanna: host generalization to extreme specialization. Acta Botanica Brasilica 25(2): 337-345. [The specificity of *Psittacanthus biternatus*, *P. eucalyptifolius* and *P. plagiophyllus* to different tree hosts is the result of mistletoe-host compatibility rather than seed deposition patterns by birds.]

Fankam, A.G., Kuete, V., Voukeng, I.K., Kuiate, J.R. and Pages, J.M. 2011. Antibacterial activities of selected Cameroonian spices and their synergistic effects with antibiotics against multidrug-resistant phenotypes. BMC Complementary and Alternative Medicine 11: 104. [*Olax subscorpioïdea* among the more active sources of antibacterial activity.]

*Fernandez-Aparicio, M., Rubiales, D., Bandaranayake, P.C.G., Yoder, J.I. and Westwood, J.H. 2011. Transformation and regeneration of the holoparasitic plant *Phelipanche aegyptiaca*. Plant Methods 7:36. (doi:10.1186/1746-4811-7-36) (A system was developed that uses cultured parasite tubercles as the starting material for *Agrobacterium rhizogenes*-mediated transformation, which also enables transformed tubercles to be clonally propagated prior to regeneration. Infection of hosts by YFP-expressing transgenic haustoria is demonstrated.)

Fite, G.L., Bruce, T., Foyer, C., Halford, N., Keys, A., Kunert, K., Lawlor, D., Parry, M. and Russell, G., 2009. Cowpea landraces of Botswana: a potential resistance source for *Alectra vogelii*. Aspects of Applied Biology 96: 111-117. [Cowpea line B359 is resistant to *A. vogelii* but has too few flowers. Screening 86 alternative cowpea lines yielded 14 landraces with immunity and 12 cultivars with useful resistance. There appeared to be a correlation between resistance and thick stem-bases which may be a useful selection criterion if confirmed.]

Fondevilla, S., Almeida, N.F., Satovic, Z.; Rubiales, D., Patto, M.C.V., Cubero, J.I. and Torres, A.M. 2011. Identification of common genomic regions controlling resistance to *Mycosphaerella pinodes*, earliness and architectural traits in different pea genetic backgrounds. Euphytica 182(1): 43-52. [Including consideration of traits for resistance to *Orobanche crenata* and identifying two new QTLs for parasite resistance.)

Foo, E. and Davies, N.W. 2011. Strigolactones promote nodulation in pea. Springer Berlin, Heidelberg, Germany, Planta 234(5): 1073-1081. [The pea *rms1* mutant is almost completely deficient in strigolactones and displayed a 40% reduction in nodules compared with wild-type plants. GR24 elevated the nodule number in wild-type plants and in the mutant to a level similar to that of untreated wild-type plants. Grafting studies showed that the shoot does not make a major contribution to root strigolactone levels.]

Frajman, B., Anderle, B. and Dakskobler, I. 2010. (*Orobanche reticulata* Wallr. Updated distribution map of *Orobanche reticulata* in Slovenia, with several new localities in the Alpine (first time in the Slovenian part of Karavanke), pre-Alpine and Dinaric phytogeographic areas.) (in Slovenian) Hladnikia 26: 61-66.

Frajman, B., Krajšek, S.S. and Dakskobler, I. 2011. (*Orobanche kochii* F. W. Schultz and *Orobanche elatior* Sutton (Orobanchaceae) - new species for the flora of Slovenia.) (in Slovenian) Hladnikia 27: 57-65. [Both species parasitise *Centaurea scabiosa* subsp. *fritschii*.]

Freire, S.M.de F., Andrade, K.N.de S., Aragão Júnior, G.A., Noronha, E.P., Silva, S.do N., Cartágenes, M.do S.de S., Borges, M.O.R., Ribeiro, M.N.de S., Torres, L.M.B. and Borges, A.C.R. 2011. Antiulcerogenic activity of the extracts of *Struthanthus marginatus*. Revista Brasileira de Farmacognosia 21(6): 1089-1095. [Aqueous extracts of *S. marginatus* were superior to hydroalcoholic extracts in reducing ulcers in rat stomachs, raising pH and increasing mucus secretion.]

Furuhashi, T., Furuhashi, K. and Weckwerth, W. 2011. The parasitic mechanism of the holostemparasitic plant *Cuscuta*. Journal of Plant Interactions 6(4): 207-219. [A general description of the parasitism of *Cuscuta* and concluding that it is a useful model plant for parasite plant research as well as plant-plant interaction research.]

Gao MeiLi, Li YongFei and Yang JianXiong. 2011. Protective effect of *Pedicularis decora* Franch root extracts on oxidative stress and hepatic injury in alloxan-induced diabetic mice. Journal of Medicinal Plants Research 5(24): 5848-5856. [In mice, extracts of *P. decora* counteracted alloxan-induced diabetic symptoms and reduced oxidative stress and hepatic injury.]`

Giannini, T.C., Takahasi, A., Medeiros, M.C.M.P., Saraiva, A.M. and Alves-dos-Santos, I. 2011. Ecological niche modeling and principal component analysis of *Krameria* Loefl. (Krameriaceae). Journal of Arid Environments 75(9): 870-872. [Niche modeling of ecological and geographical aspects of the 18 *Krameria* spp. suggest that N. American species occur mostly in desert or xeric ecoregions with monthly rain below 140 mm and large temperature ranges. S. American species are mainly found in desert and subtropical savannas where monthly rain often exceeds 150 mm and temperature ranges are smaller.]

Gao MeiLi, Wang YiLi, Wang LiJuan, Li YongFei and Yang JianXiong. 2011. Modification of oxidative stress in acute exhaustive exercise mice with n-butanol and water fractions from *Pedicularis decora* Franch root treatment. African Journal of Pharmacy and Pharmacology5 (7): 853-861. [Showing that extracts of *P. decora* may protect mice against oxidative stress induced by acute exhaustive exercise.]

Gao ZhanYou, Zhou HaiTao and Lin Qiang. 2011. Effects of HERBA CISTANCHES on the ability of resistance exercise-induced fatigue in rats and free radical in brain tissue. Medicinal Plant 2(5): 30-32. [Extracts of *Cistanche* spp. lessen the lipid peroxidation in brain tissue of rats and oxidative damage of mitochondria resuling from exercise-induced fatigue.]

Gediya, S.K., Mistry, R.B., Patel, U.K., Blessy, M. and Jain, H.N. 2011. Herbal plants: used as a cosmetics. Journal of Natural Product and Plant Resources 1(1): 24-32. [Including reference to the use of sandalwood (*Santalum* spp.) in skin care.]

Ghimire, B.K., Seong EunSoo, Kim EunHye, Ghimeray, A.K., Yu ChangYeon, Ghimire, B.K. and Chung IllMin. 2011. A comparative evaluation of the antioxidant activity of some medicinal plants popularly used in Nepal. Journal of Medicinal Plants Research 5(10): 1884-1891. [*Cuscuta refexa* and *Santalum album* among species tested but not among the most active.]

*Ghotbi, M. and Ghotbi, M. 2011. Host category defining to mitigate *Orobanche aegyptiaca* Pers. infestation. Abstract presented at 3rd International Symposium on Environment and Invasive Plants. Ascona, Switzerland, October, 2011. European Weed Scierce Society. (http://www.ewrs.org/doc/EWRS_Invasive_Ascona_Abstracts_2011.pdf) [A range of crop plants were incorporated into soil in pots together with seed of *Orobanche aegyptiaca* 2 months before planting tomato. Cotton and sorghum caused greatest reduction in *O. aegyptiaca* infestation.]

Girlanda, M., Segreto, R., Cafasso, D., Liebel, H.T., Rodda, M., Ercole, E., Cozzolino, S., Gebauer, G. and Perotto, S. 2011. Photosynthetic Mediterranean meadow orchids feature partial mycoheterotrophy and specific mycorrhizal associations. American Journal of Botany 98(7): 1148-1163. [*Ophrys fuciflora*, *Anacamptis laxiflora*, *Orchis purpurea*, and *Serapias vomeracea* show varying degrees of mycoheterotrophy.]

Govindappa, M., Channabasava, R., Sowmya, D.V., Meenakshi, J., Shreevidya, M.R., Lavanya, A., Santoyo, G. and Sadananda, T.S. 2011. Phytochemical screening, antimicrobial and *in vitro* anti-inflammatory activity of endophytic extracts from *Loranthus* sp. Pharmacognosy Journal 3(25): 82-90. [Identifying *Aspergillus niger*, *Penicillium* sp. and *Alternaria alternate* as endophytes in *L. micranthus* (= *Ileostylus micranthus*) in India and

confirming anti-inflammatory activity in extracts from these endophytes.]

Gunaga, R.P., Hanumantha, M., Girish Shahapurmath and Vasudeva, R. 2011. Clonal variation for Loranthus infestation in Teak (*Tectona grandis* L. F.). Indian Journal of Forestry 34(2): 203-208. [Among 24 clones of teak surveyed for incidence of *Dendrophthoe falcata*, MySS1 and MySS2 showed least infection (ca. 4%) while others showed up to 48% infection.]

Hafsa Deshmukh and Prabhu, P.J. 2011. Development of RP-HPLC method for qualitative analysis of active ingredient (gallic acid) from stem bark of *Dendrophthoe falcata* Linn. International Journal of Pharmaceutical Sciences and Drug Research 3(2): 146-149.

Hanks, E.M., Hooten, M.B. and Baker, F.A. 2011. Reconciling multiple data sources to improve accuracy of large-scale prediction of forest disease incidence. Ecological Applications 21(4): 1173-1188. [An inventory of black spruce stands in northern Minnesota found *Arceuthobium pusillum* in 11% of surveyed stands, while a small, specific-pest survey found mistletoe in 56% of the surveyed stands. The two surveys were reconciled within a Bayesian hierarchical framework, predicting that 35-59% of black spruce stands in northern Minnesota are infested with dwarf mistletoe.]

Hassan, M.M., Abdelhalim, T.S., Yagoub, S.O., Osman, A.G. Gain, M.E.A. and Babiker, A.G.E. 2011. Effects of arbuscular mycorrhiza fungi (AMF), plant growth promoting bacteria (PGPR) and interaction on *Striga hermonthica* management in sorghum. International Journal of Agriculture: Research and Review 1(3): 107-115. [Innoculation of sorghum with AM fungi in a pot experiment reduced emergence of *S. hermonthica* by 82% and increased sorghum dry matter by 28%. There was little further improvement with addition of *Flavobacteria* and *Azotobacter* spp.]

Hassan, M.M., Gani, M.E.S.A. and Babiker, A.G.T. 2011. Effects of bacterial strains and isolates on in situ germination, subsequent developmental stage of *Striga sermonthica* onto sorghum roots. Advances in Environmental Biology 5(1): 3263-3269. [A range of bacterial isolates including *Azospirillum brasilense* and *Pseudomonas putida* showed varying effects on the germination and further development of *S. hermonthica*, the most active being an undefined isolate 'GSL' reducing attachment by 80%.]

Hassan, M.M., Osman, M.G., Ahmed, M.M.M., Abdalaleem, K.G., Gain, M.E.A. and Babiker, A.G.T. 2011. Tissue culture technique as new approach to combat *Striga hermonthica*. Advances in Environmental Biology 5(8): 2122-2128. [Among a range of compounds tested, IAA, IBA and cytokinins induced germination of *S. hermonthica*.]

He WenJun, Fang TaiHui and Tu PengFei. 2009. (Research progress on pharmacological activities of echinacoside.) (in Chinese) China Journal of Chinese Materia Medica 34(4): 476-479. [Reviewing evidence for effectiveness of the phenylethanoid glycoside echinacoside, extracted from *Cistanche salsa*, for its neuroprotective, anti-inflammatory, anti-tumour, anti-aging, immunoregulation effects and preventing liver injuries.]

He XiangHui, Yang WenZhi, Ye Min, Wang Qing and Guo Dean. 2011. Differentiation of *Cuscuta chinensis* and *Cuscuta australis* by HPLC-DAD-MS analysis and HPLC-UV quantitation. Planta Medica 77(17): 1950-1957.

*Hegde, P., Maddur, M.S., Friboulet, A., Bayry, J. and Kaveri, S.V. 2011. *Viscum album* exerts anti-inflammatory effect by selectively inhibiting cytokine-induced expression of cyclooxygenase-2. PLoS ONE, October, 2011: e26312. (http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0026312)

Hejcman, M., Stetinova, Z., Hejcmanová, P., Pavlů, V. and Schellberg, J. 2011. Plant density and seed production of *Rhinanthus minor* under long-term Ca, N, P and K fertiliser application in the Rengen Grassland Experiment (Germany). In: Pötsch, E.M., Krautzer, B. and Hopkins, A. (eds) Grassland farming and land management systems in mountainous regions. Proceedings of the 16th Symposium of the European Grassland Federation, Gumpenstein, Austria, 29th-31st August, 2011: 595-597. [Comparing growth of *R. minor* in plots of varying fertility. Lowest fertility gave highest number of plants (745 v. 5 per m^2) and highest seed production (18142 v. 195) conmpared with the most fertile.]

Heiniger, U., Theile, F., Rigling, A. and Rigling, D. 2011. Blue-stain infections in roots, stems and branches of declining *Pinus sylvestris* trees in a dry inner alpine valley in Switzerland. Forest Pathology 41(6): 501-509. [Incidentally noting mistletoe (presumably *Viscum album*) among other factors contributing to mortality of *P. sylvestris*.]

Hellström, K., Bullock, J.M. and Pywell, R.F. 2011. Testing the generality of hemiparasitic plant effects on mesotrophic grasslands: a multi-site experiment. Basic and Applied Ecology 12(3): 235-243. [Results confirm that it is possible to establish *Rhinanthus minor* into different mesotrophic grassland communities representing a variety of soil types and ages, suggesting it is a practical and widely applicable tool for restoration.]

Her SunMi, An HyoSun, Kim KyuDae, Kim YoungHoon, Yoon TaekJoon and Kim JongBae. 2011. (Immunoadjuvant activity of Korean mistletoe Lectin B-chain.) (in Korean) Korean Journal of

Pharmacognosy 42(3): 246-252. [Discussing the relative merits of the A- and B-chains in extracts from *Viscum album* var. *coloratum* but abstract not clear.]

Hong Lan, Shen Hao, Chen Hua, Li Ling, Hu XiaoYing, Xu XinLan, Ye WanHui and Wang ZhangMing. 2011. The morphology and anatomy of the haustoria of the holoparasitic angiosperm *Cuscuta campestris*. Pakistan Journal of Botany 43(4) 1853-1859. [Development of the haustorium resembles that of root parasites with initial divisions in the cortex with the suggestion that vascular tissue differentiation is linked with host contact by the searching 'hyphae'.]

Hosagoudar, V.B. and Sabeena, A. 2011. Five new Meliolaceae members from Kerala, India. Bioscience Discovery Journal 2(1): 117-121, [Recording the fungus *Asteridiella anacolosae* on an *Anacolosa* sp. (Olacaceae).]

Hou Yuan, Cheng XiaoYue, Ren GuoHua, Deng Bin and Shang ZhanHuan. 2011. Allelopathic effects of the typical "black soil land" poisonous plant on *Pedicularis kansuensis* in Qinghai-Tibetan Plateau. Acta Botanica Boreali-Occidentalia Sinica 31(8): 1651-1656. [Roots of *Oxytropis ochrocephala* and leaves of *Artemisia nanschanica* prove usefully allelopathic to *P. nanschanica*, a local cause of pasture degradation.]

Houehanou, T.D., Kindomihou, V. and Sinsin, B. 2011. Effectiveness of conservation areas in protecting shea trees against hemiparasitic plants (Loranthaceae) in Benin, West Africa. Plant Ecology and Evolution 144(3): 267-274. [Shea trees, *Vitellaria paradoxa*, showed heavy infestation by unspecified mistletoe (presumably *Tapinanthus* spp.), up to 80%, in cultivated areas, and much lower infestation in 'protected' (hunting) areas.)

Hu GaoSheng, Jia JingMing, Hur YeonJae, Chung YoungSoo, Lee JaiHeon, Yun DaeJin, Chung WooSik, Yi GiHwan, Kim TaeHo and Kim DohHoon. 2011. Molecular characterization of phenylalanine ammonia lyase gene from *Cistanche deserticola*. Molecular Biology Reports 38(6): 3741-3750.

Hu KeFei, Li YongHua, Du YuKai, Su BenWei and Lu Dong. 2011. Analysis of 1-deoxynojirimycin component correlation between medicinal parasitic loranthus from loranthaceae and their mulberry host trees. Journal of Medicinal Plants Research 5(17): 4326-4331. ['*Loranthus*' not defined.]

Huang DongJia, Chen Hua, Wei Xiao, Shen Hao and Ye WanHui. 2011. (Characteristics of haustorium of holoparasite *Cuscuta campestris*.) (in Chinese) Guangxi Zhiwu / Guihaia 31(4): 451-455. [A detailed study and description of the penetration of *C. campestris* into *Mikania micrantha*.]

Huang, S., Chen, J.H., Gong, M., Huang, M.Q., Li, J., Wu, A.G. and Lai, X.P. 2010. (Studies on the flavonoids from the herb of *Striga asiatica.*) (in Chinese) Zhong Yao Cai 33(7): 1089-1091. [Eleven compounds were obtained, six of them identified as flavonoids, including 4 not previously recorded in *S.asiatica*.]

*Huber, R., Ludtke, H., Wieber, J. and Beckmann, C. 2011. Safety and effects of two mistletoe preparations on production of interleukin-6 and other immune parameters - a placebo controlled clinical trial in healthy subjects. BMC Complementary and Alternative Medicine 11(116): 30 pp. (http://www.biomedcentral.com/content/pdf/1472-6882-11-116.pdf) [In Germany, 'Iscucin® Populi' (IP), a preparation from *Viscum album* growing on poplar, is used in cancer therapy while 'Viscum Mali e planta tota' (VM), from apple, is used in patients with osteoarthritis. In a study involving 71 healthy volounteers, treatment with IP results in eosinophilia and an increase of CD4 cells but not in an increase of IL-6 or CRP. No safety concerns regarding the two mistletoe preparations have been raised by this study.]

Illa, A.O., Odhiambo, G.D. and Dida, M.M. 2010. Increasing imazapyr-resistant maize yield by increasing plant density under natural *Striga hermonthica* infestation. Agriculture and Biology Journal of North America 1(5): 1061-1068. [Increasing the plant density of herbicide-treated IR maize from 44,444 to 88,888 plants per ha did not affect *Striga* incidence but increased maize yield from 1.60 to 3.48 t per ha.]

Illana, A., García-Garrido, J.M., Sampedro, I. and Ocampo, J.A. and Vierheilig, H. 2011. Strigolactones seem not to be involved in the nonsusceptibility of arbuscular mycorrhizal (AM) nonhost plants to AM fungi. Botany 89(4): 285-288. [Strigolactones are important factors in the establishment of mycorrhizal symbiosis. In the strigolactone-deficient *rms1* mutant (*ccd8*) of pea, colonization of roots is reduced which can be rescued by the application of GR24. However, the authors show that the application of GR24 cannot facilitate colonization of AM non-host plants.]

Imoloame, E.O. Joshua, S.D. 2011. Effect of cultural methods on *Striga* (*Striga hermonthica* (Del.)) Benth management and yield of cereals in the Savanna Zone of Nigeria: a review. Archives of Phytopathology and Plant Protection 44(17): 1655-1665. [Reporting good suppression of *S. hermonthica* and improved yields with various combinations of resistant maize and rice varieties with cowpea and soybean rotations, intercropping with bambara nuts and/or nitrogen applications. For sorghum, results disappointing due to low yields of resistant varieties.]

Iqbal, M.N. and Suradker, S.S. 2011. Ethnobotanical and ethnomedicinal study of some medicinal plants of Barshitakli Tahsil District Akola (MS) India.

Bioscience Discovery Journ 2(2): 236-239. [Documenting the local uses of 10 species, including *Cuscuta reflexa*.]

Irum Mukhtar, Ibatsam Khokhar and Sobia Mushtaq. 2011. *Cuscuta campestris* Yunck., a new pest of *Capsicum frutescens* L. (hot chilli) in Lahore-Pakistan. Pakistan Journal of Weed Science Research 17(1): 103-110.

Isah, K.M. and Lagoke, S.T.O. 2010. Effect of *Striga hermonthica* on host crop genotypes planted in rotation with trap crop varieties in the Southern Guinea Savanna of Nigeria. Nigerian Journal of Weed Science 23: 25-44. [Groundnut var. SAMNUT 11 and cotton var. SAMCOT 10 were consistently the most effective trap crop varieties in this study improving yields of maize and rice, especially after 2 years.]

Isah, K.M., Lagoke, S.T.O., Elemo, K. and Ariyo, O.J. 2009. Differential reaction of host crop varieties to *Striga hermonthica* of different crop and location sources. Nigerian Journal of Weed Science 22: 1-14. [Varying responses from 3 varieties each of maize, sorghum and rice.]

*Ishida, J.K., Yoshida, S., Ito, M., Namba, S. and Shirasu, K. 2011. *Agrobacterium rhizogenes*-mediated transformation of the parasitic plant *Phtheirospermum japonicum*. PLoS ONE, October, 2011: e25802. (http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0025802) [Transgenic hairy roots of *P. japonicum* were obtained from cotyledons 2 to 3 weeks after A. rhizogenes inoculation. A Cyclin B1 promoter fused to a reporter gene was used to visualize cell division during haustorium formation.]

*Ito, S., Umehara, M., Hanada, A., Kitahata, N., Hayase, H., Yamaguchi, S. and Asami, T. 2011. Effects of triazole derivatives on strigolactone levels and growth retardation in rice. PLoS ONE July: e21723. (http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0021723) [In a structure-activity relationship study using the SL biosynthesis inhibitor TIS13, a more potent and specific inhibitor TIS108 was found. Treatment of rice seedlings with TIS108 reduced SL levels in roots and root exudates as well as *Striga* germination and did not reduce plant height. TIS108 may have potential to be applied in the control of root parasitic weeds.]

Iverson, R.D., Westbrooks, R..G., Eplee, R.E. and Tasker, A.V.. 2011. Overview and Status of the Witchweed (*Striga asiatica*) Eradication Program in the Carolinas. In: Leslie, A.R. and Westbrooks, R.G. (eds) Invasive Plant Management Issues and Challenges in the United States: 2011 Overview. American Chemical Society, pp. 51-68. [Reviewing the US Witchweed eradication programme and the methods and procedures that have been used to reduce the extent of the 175,000 ha problem by 99% since it was first recognised in 1956.]

Iwo, G.A. Uwah, D.F. 2007. Efficacy of beniseed (*Sesamum indicum*) as a trap crop to *Striga* species (parasitic weed). Nigerian Journal of Weed Science 20: 47-51. [Identifying 5 out of 25 sesamum varieties with greater trap-crop potential against *S. hermonthica*.]

Jackson, D.D., Shiju, L., Jebasingh, D. and Huxley, V.A.J. 2009. Memory enhancement potential of *Santalum album* extracts on albino mice. Journal of Theoretical and Experimental Biology 5(3/4): article 151. [Defining the anti-oxidant effect of different extracts of *S. album*, presumably with some potential in treatment of memory loss.]

Jadhav, N., Patil, C.R., Chaudhari, K.B., Wagh, J.P., Surana, S.J. and Jadhav, R.B. 2010. Diuretic and natriuretic activity of two mistletoe species in rats. Pharmacognosy Research 2(1): 50-57. [Concluding that polyphenolics and triterpenoids, such as oleanolic acid and lupeol, are the major phytochemicals involved in the diuretic activity of extracts from *Viscum articulatum* and *Helicanthus elastica* in rats.]

Jamil, M., Charnikhova, T., Cardoso, C., Jamil, T., Ueno, K., Verstappen, F., Asami, T. and Bouwmeester, H.J. 2011. Quantification of the relationship between strigolactones and *Striga hermonthica* infection in rice under varying level. Weed Research (Oxford) 51(4): 373-385. [Exudation of strigolactones by rice was highest under nitrogen- and particularly phosphorus-deficient conditions and cv. IAC 165 produced about 100-fold higher amounts than cv. TN 1. There was a positive relationship between the amount of strigolactones in the exudates and *S. hermonthica* germination and attachment, suggesting that reduction in strigolactone production is at least one of the mechanisms by which fertiliser application reduces damage in cereals by parasitic weeds.]

Jamil, M., Rodenburg, J., Charnikhova, T. and Bouwmeester, H.J. 2011. Pre-attachment *Striga hermonthica* resistance of NERICA cultivars based on low strigolactone production. New Phytologist 192: 964–975. [Across a range of NERICA rice lines and their parents *Oryza sativa* and *O. glaberrima*, there was considerable variation in the exudation of strigolactones. There was a positive relationship between the amount of strigolactones in the exudate and the germinationof *S. hermonthica* and its attachment and emergence rates. Varieties NERICA 1 and CG14 exhibited lowest induction of germination.]

Joel, D.M., Barl, H., Mayer, A.M., Plakhine, D., Ziadnel, H., Westwood, J.H. and Welbaum, G.E. 2011. Seed ultrastructure and water absorption pathway of the

root-parasitic plant *Phelipanche aegyptiaca* (Orobanchaceae). Annals of Botany 109(1): 181-195. [A detailed analysis of the ultrastructure of the seed of *P. aegyptiaca* and the processes of imbibition and metabolism in the seed leading to germination.]

Johnson, S.D., Burgoyne, P.M., Harder, L.D.and Dötterl, S. 2011. Mammal pollinators lured by the scent of a parasitic plant. Proceedings of the Royal Society of London. Series B, Biological Sciences 278(1716): 2303-2310. [Aliphatic ketones 3-hexanone and 1-hexen-3-one dominate the scent of *Cytinus visseri* (Cytinaceae) which attracts rodents for pollination. Plants attracting insects tend to produce terpenoids, aromatic or non-ketone aliphatic compounds.]

Kaitera, J., Hantula, J. and Nevalainen, S. 2011. Distribution and frequency of *Cronartium flaccidum* on *Melampyrum* spp. in permanent sample plots in Finland. Scandinavian Journal of Forest Research 26(5): 413-420. [Occurrence of pine stem rust *C. flaccidum* recorded on *Melampyrum sylvaticum*, *M. pratense* and *M. nemorosum*. A possible tenuous relationship with rust incidence in host trees is discussed.]

Kaitera, J. and Hiltunen, R. 2011. Susceptibility of *Pedicularis* spp. to *Cronartium ribicola* and *C. flaccidum* in Finland. Forest Pathology 41(3): 237-242. [Concluding that *P. palustris m*ay play a role in the spread of *Cronartium* rust species in natural forests.]

Kala, C.P. 2011. Medicinal plants used for dermatological disorders: a study of Uttarakhand state in India. Australia, Australian Journal of Medical Herbalism 23(3): 132-137. [*Cuscuta reflexa* among 'important' species used in the treatment of a number of eskin conditions.]

Kaluz, S., Literak, I., Capek, M., Konecny, A. and Koubek, P. 2011. A new mite species of the genus *Lasioseius* (Acarina: Gamasina, Blattisociidae) associated with the flowers of *Englerina lecardii* and *Chalcomitra senegalensis* (Aves: Nectariniidae) in Senegal. International Journal of Acarology 37(6): 511-524. [The new species *L. senegalensis* was found in Senegal on flowers of *Englerina lecardii* and on beaks of the pollinating sunbird.]

Kamara, A.Y., Ekeleme, F., Omoigui, L., Menkir, A., Chikoye, D. and Dugje, I.Y. 2011. Response of exotic sorghum (*Sorghum bicolor* [L.] Moench) cultivars to planting date under natural infestation of *Striga hermonthica* (Del) Benth. in the Sudan savanna zone of northeast Nigeria. Archives of Agronomy and Soil Science 57(6): 679-692. [Noting that the success of the improved varieties P9402, P9405, and PSL985061, and local KSV8 under infestation by *S. hermonthica* depended on planting date, earlier planting usually being best.]

Kameda, G., Kempf, W., Oschlies, I., Michael, K., Seifert, G. and Längler, A. 2011. Nodal anaplastic large-cell lymphoma ALK-1- with CD30+ cutaneous lymphoproliferation treated with mistletoe: spontaneous remission or treatment response? Klinische Pädiatrie 223(6): 364-367. [Within 1 week after initiation of treatment with a *Viscum album* preparation, skin lesions and lymph node enlargement improved and under continuing *V. album* therapy the patient was still in complete remission 30 months after diagnosis.]

Khan, Z.R. and 16 others. 2009. Control of stem borers and striga in African cereals: a low input push-pull approach with rapidly expanding impact. Aspects of Applied Biology 96: 71-76. [A review covering the use of *Desmodium* spp. to control *Striga hermonthica* concluding that 'The push-pull technology raises the farming level above subsistence by improving cereal yields and by providing animal forage, and the evidence also suggests that it does so whilst stabilising a high density rural population.']

Khan, Z., Midega, C., Pittchar, J., Pickett, J., Bruce, T. and Pretty, J. 2011. Push-pull technology: a conservation agriculture approach for integrated management of insect pests, weeds and soil health in Africa. UK government's foresight food and farming futures project. International Journal of Agricultural Sustainability 9(1): 162-170. [A general description of the technique, including the use of *Desmodium* spp. to control *Striga hermonthica*, and noting its adoption by over 30,000 farmers in East Africa to date.]

*Kienle, G.S., Grugel, R. and Kiene, H. 2011. Safety of higher dosages of *Viscum album* L. in animals and humans - systematic review of immune changes and safety parameters. BMC Complementary and Alternative Medicine 11: 72. (http://www.biomedcentral.com/content/pdf/1472-6882-11-72.pdf) [Reviewing 69 clinical studies and 48 animal experiments involving *V. album* extracts or isolated mistletoe lectins and concluding that there were no serious side-effects at relatively high dosages.]

Kim KiSoo, Kim GwiMan, Ji Hoon, Park SungUk and Yang ChulJu. 2011. Effect of dietary supplementation of *Alisma canaliculatum* (alismatis rhizoma) and *Viscum album* (mistletoe) on growth performance and immunity in broiler chickens. Korean Journal of Poultry Science 38(1): 21-28. [Providing some evidence for the potential of a *Viscum album* supplement to replace antibiotic in poultry feed.]

Kirsch, A. and Hajto, T. 2011. Case reports of sarcoma patients with optimized lectin-oriented mistletoe extract therapy. Journal of Alternative and Complementary Medicine 17(10: 973-979.

[Reporting that 6 patients with sarcoma, treated with a *Viscum album* lectin preparation, showed remissions of tumour symptoms, apparently due to an improved balance of natural immunological mechanisms.]

Koca, U., Küpeli-Akkol, E. and Sekeroglu, N. 2011. Evaluation of *in vivo* and *in vitro* biological activities of different extracts of *Cuscuta arvensis*. Natural Product Communications 6(10): 1433-1436. [Methanolic and water extracts from *C. arvensis* (= *C. campestris*) showed greater anti-nociceptive and anti-inflammatory activity than non-polar extracts.]

Kohlen, W. 2011. Regulation of biosysnthesis and transport of strigolactones and their effect on plant development. PhD Thesis. Wageningen University, Wageningen, Netherlands, 192 pp. [Reviewing the creation of functional analogs and inhibitors of plant hormones with examples of brassinosteroids, ABA biosynthesis inhibitors and regulators of strigolactone function: SL mimics, SL biosynthesis inhibitor and SL biosynthesis regulation through gibberellin. See full summary above.]

Kohlschmid, E., Müller-Stöver, D. and Sauerborn, J. 2011. (Spreading of the parasitic weed *Phelipanche ramosa* in German agriculture.) (in German) Gesunde Pflanzen 63(2): 69-74. [*P. ramosa*, previously extensive on hemp, now attacks tobacco and parsley and threatens to spread to oilseed rape, tomato and potato.]

Kolo, M.G.M. and Adamu, S.U. 2006. Rotation of food legume trap crops with maize for *Striga hermonthica* (DEL) Benth management, at Gwagwalada, Nigeria. Nigerian Journal of Weed Science 19: 49-55. [Finding cowpea and groundnut superior to soyabean as trap crops.]

Koltai, H. 2011. Strigolactones' ability to regulate root development may be executed by induction of the ethylene pathway. Plant Signaling and Behavior 6(7): 1004-1005. [Analysis of hormone-signalling mutants combined with hormonal treatments suggests that strigolactones and ethylene regulate root hair elongation via a common regulatory pathway, in which ethylene is epistatic to strigolactones. The regulation of root hair elongation by SL and auxin converge via the ethylene pathway and this includes regulation of auxin transport.]

Krause, K. 2011. Piecing together the puzzle of parasitic plant plastome evolution. Planta 234(4) 647-656. [This review proposes that gene loss in plastids may follow a ‘domino effect’ in which loss of one gene triggers loss of other dependent genes.]

Kuijt, J. 2011. Pulling the skeleton out of the closet: resurrection of *Phthirusa* sensu Martius and consequent revival of *Passovia* (Loranthaceae). Plant Diversity and Evolution 129: 159-211. [The author reconstitutes *Phthirusa*, resurrects *Passovia*, and reduces *Ixocactus* to a synonym.]

Kumar Vikas, Pankajkumar, S.Y., Udayaa, P.S., Raj, B.H., Rana Amar and Kamaruz, Z.M. 2010. Pharmacognostical evaluation of *Cuscuta reflexa* Roxb. Pharmacognosy Journal 2(6): 74-82.

Kumbasli̇, M., Keten, A., Beskardes, V., Maki̇neci̇, E., Özdemi̇r, E., Yi̇lmaz, E., Zengi̇n, H., Sevgi̇, O., Yi̇lmaz, H.C. and Cali̇skan, S. 2011. Hosts and distribution of yellow mistletoe (*Loranthus europaeus* Jacq. (Loranthaceae)) on Northern Strandjas Oak Forests-Turkey. Scientific Research and Essays 6(14): 2970-2975. [Survey showed 2.3% of trees infested overall; highest occurrence was in *Quercus petraea*; none detected in *Quercus cerris*.]

Kureh, I., Hussaini, A.M., Odunze, A.C., Chikoye, D., Emechebe, A.M., Tarawali, G., Franke, A.C. and Ellis-Jones, J. 2006. Agronomic performance of integrated *Striga hermonthica* management strategies. Nigerian Journal of Weed Science 19: 41-48. [Benefits from tolerant maize, trap crops and N application.]

Lagoke, S.T.O. and Isah, K.M. 2010. Reaction of maize varieties to *Striga hermonthica* as influenced by food legume intercrop, spacing and split application of compound fertilizer. Nigerian Journal of Weed Science 23: 45-58. [Best results obtained with planting two stands of groundnut or three stands of soyabean between two stands of *Striga*-resistant maize genotypes spaced at 50 cm, given split-application of fertilizer at total rate of 100 kgN/ha, 50 kgP2O5/ha and 50 kgK2O/ha.]

Lekhak, M.M., Chavan, J.J., Janarthanam, M.K., Pai, I.K. and Yadav, S.R. 2011. Corolla elongation as an aid in self-pollination in *Rhamphicarpa longiflora* (Scrophulariaceae). Current Science 100(11): 1624-1626.

Lemaire, B., Huysmans, S., Smets, E. and Merckx, V. 2011. Rate accelerations in nuclear 18S rDNA of mycoheterotrophic and parasitic angiosperms. Journal of Plant Research 124(5) 561-576. [A survey of the mutation rates in 33 parasitic and 37 mycoheterotrophic species reveals accelerated rates compared to autotrophic relatives. Translational function appears to be retained and reasons for rate differences are explored.]

Lewis, K.J. 2011. Forest health and mortality of advance regeneration following canopy tree mortality caused by the mountain pine beetle. Mountain Pine Beetle Working Paper - Pacific Forestry Centre, Canadian Forest Service 2010-03. [Incidentally emphasising the continuing threat to Canadian forests from *Arceuthobium* spp.]

Li ChunYu, Zhao GuoBin, Zhang YuHong, Wang Shu, Xue GuiPing and Zhang DanShen. 2011. (Optimization of salt stir-baking technology for *Cuscutae Semen* by uniform design.) (in Chinese) Zhongcaoyao = Chinese Traditional and Herbal

Drugs 42(8): 1537-1540. [Optimum preparation involved salt 2%, immersing time 60 min, baking temperature 170°C, and baking time 60 min.]

Li Yang, Zhao YanLi, Yang YongPing and Li XiaoLi. 2011. Chemical constituents of *Viscum album* var. *meridianum*. Biochemical Systematics and Ecology 39(4/6): 849-852. [Flavanones, flavanone glycosides and triterpenenes among the major components of *V. album* var. *meridianum*.]

Liao Kuo, Gituru, R.W., Guo YouHao; andWang QingFeng. 2011. The presence of co-flowering species facilitates reproductive success of *Pedicularis monbeigiana* (Orobanchaceae) through variation in bumble-bee foraging behaviour. Annals of Botany 108(5): 877-884 [Pollination of *P. monbeigiana* enhanced in a mixed population with *Vicia dichroantha*.]

Lin HuiBin, Yang JinPing and Lin JianQiang. 2011. Influence of hosts on polysaccharide content in *C. chinensis* and *C. australis*. China Journal of Trad itional Chinese Medicine and Pharmacy 26(9): 2005-2008. [Confirming that polysaccharide content of *Cuscuta* spp. can indeed be influenced by their hosts.]

Lin MingKuem, Yu YenLing, Chen KaiChieh, Chang WenTe, Lee MengShiou, Yang MengJa, Cheng HsinChung, Liu ChienHeng, Chen DzChi and Chu ChingLiang. 2011. Kaempferol from *Semen cuscutae* attenuates the immune function of dendritic cells. Immunobiology 216(10): 1103-1109. [Confirming that extracts of *Cuscuta* spp. exhibit an immunosuppressive effect on dendritic cells and that the active ingredient kaempferol has potential in the treatment of chronic inflammatory and autoimmune disease.]

Liu YeWei,Li HongBing,Wang XiaoFei,Zhang GeXiang,Wang Yu and DuoLong. 2011. Evaluation of the free radical scavenging activity of *Cynomorium songaricum* Rupr. by a novel DPPH-HPLC method. Journal of Food Science 76(9): C1245-C1249. [Results showed that the free radical scavenging activity of the samples of *C. songaricum* from different sites varied significantly.]

Liu MengJiao, Hong Lan, Shen Hao, Wei Xiao, Ye WanHui and Cao HongLin. 2011. Responses of *Mikania micrantha* to parasitization of *Cuscuta campestris* in total soluble protein content and activities of antioxidant enzymes. Guangxi Zhiwu / Guihaia 31(4): 520-525. [*C. campestris* significantly lowered soluble protein content in *M. micrantha*. Activities of superoxide dismutase and peroxidise significantly increased at a density of 1 parasite per host plant; but both activities decreased up to 8 per host.]

Liu W, Kohlen W, Lillo A, Op den Camp R, Ivanov S, Hartog M, Limpens E, Jamil M, Smaczniak C, Kaufmann K, Yang WC, Hooiveld GJ, Charnikhova T, Bouwmeester HJ, Bisseling T, Geurts R. 2011. Strigolactone biosynthesis in *Medicago truncatula* and rice requires the symbiotic GRAS-type transcription factors NSP1 and NSP2.Plant Cell23(10): 3853-3865. [NODULATION SIGNALING PATHWAY1 (NSP1) and NSP2 are essential for rhizobium Nod factor-induced nodulation and are shown here to be indispensable for strigolactone (SL) biosynthesis in the legume*Medicago truncatula* and in rice. The disturbed SL biosynthesis in nsp1 nsp2 mutant backgrounds correlates with reduced expression of DWARF27, a gene essential for SL biosynthesis.]

Liu Yang, Sheng Yu, Yuan GuangXin, Wang Yan, Wei HuiFang, Guan Ming and Pei Jin. 2011. Purification and physicochemical properties of different polysaccharide fractions from the water extract of *Boschniakia rossica* and their effect on macrophages activation. International Journal of Biological Macromolecules 49(5): 1007-1011.

Lopez O., M. and Cervantes P., L. 2010. Life histories of *Ramosiana insignis* (Blanchard) and *Vulsirea violacea* (f.) (Hemiptera-Heteroptera: Pentatomidae), with descriptions of immature stages. Proceedings of the Entomological Society of Washington 112(1): 81-96. [Both species occur on *Schoepfia schreberi* (Olacaceae).]

López-Ráez, J.A., Pozo, M.J. and García-Garrido, J.M. 2011. Strigolactones: a cry for help in the rhizosphere. Botany 89(8): 513-522. [Reviewing the role of strigolactones - and other plant hormones – in AM symbiosis and host-parasitic plant interaction and potential use of this molecular dialogue as a target for new control strategies against root parasitic weeds.]

Luan Na, Chang Ping, Zhuang LiYing and Shang XiaoYa 2010. Isolation and determination of catechin from *Cynomorium songaricum* Rupr. Medicinal Plant 1(8): 87-88.

Luisi, A., Lorenzi, R. and Sorce, C. 2011. Strigolactone may interact with gibberellin to control apical dominance in pea (*Pisum sativum*). Plant Growth Regulation 65(2): 415-419. [Experiments in which GR24 was applied to decapitated climbing and dwarf (gibberellin biosynthesis mutant) peas suggest that the endogenous level of gibberellin GA_1 modulates the response of decapitated pea plants to GR24, by changing bud sensitivity to the applied strigolactone.]

Luo Xiang, Zhai ZhiXi, Guo YuHai, Du You and Zhu YanXia. 2011. (Optimization of infection by *Cistanche tubulosa* on *Tamarix chinensis* assimilate distribution.) (in Chinese) Journal of China Agricultural University 16(4): 43-47. [Parasitism of *T. chinensis* by *C. tubulosa* resulted in increases in chlorophyll content and photosynthesis in the host.

37% of photosynthate was transferred to the parasite.]

Luo Xiang, Zhu YanXia, Zhao DongPing and Guo YuHai. .2010. Parasitism response of *Cistanche tubulosa* in root of *Tamarix chinensis.* Plant Physiology Communications 46(12): 1211-1214.

Lyu SuYun and Park WonBong. 2011. Gene network analysis on the effect of *Viscum album* var. *coloratum* in T cells stimulated with anti-CD3/CD28 antibodies. Archives of Pharmacal Research 34(10): 1735-1749. [An analysis of gene expression induced by *V. album* var. *coloratum* agglutinin (VCA) following incubation in human T cells revealed activation and inhibition of genes involved in a wide range of immune functions in line with the broad mechanisms of anti-cancer action of VCA.]

Maalouf, F., Khalil, S., Ahmed, S., Akintunde, A.N., Kharrat, M., El-Shama'a, K., Hajjar, S. and Malhotra, R.S. 2011. Yield stability of faba bean lines under diverse broomrape prone production environments. Field Crops Research 124(3): 288-294. [Faba bean lines derived from hybrid bulk populations HBP/DS0/2000 and HBP/ES0/2000 were superior to susceptible lines under infestation by *Orobanche crenata* but yielded comparatively less well in uninfested soil.]

Mabrouk, Y., Mejri, S., Hemissi, I., Simier, P., Delavault, P., Saidi, M. and Belhadj, O. 2010. Bioprotection mechanisms of pea plant by *Rhizobium leguminosarum* against *Orobanche crenata*. African Journal of Microbiology Research 4(23): 2570-2575. [Results suggest that the mechanisms of induced resistance by *Rhizobia* against *O. crenata* involve an elevated induction of the phenylpropanoid pathway, conferring mechanical and chemical barriers against the invading parasite.]

Maikai, V.A. 2010. *In vitro* and *in vivo* evaluation of anti-trypanosomal activity of stem bark of *Ximenia americana*. International Journal of Biology 2(2): 50-54. [Results showed that *Ximenia americana* (Olacaceae) had *in vitro* and *in vivo* efficacy against *Trypanosoma congolense*.]

Maikai, V.A. 2011. Antitrypanosomal activity of flavonoid extracted from *Ximenia americana* stem bark. International Journal of Biology 3(1): 115-121. [Confirming that the antitrypanosomal activity of *X. americana* extract is associated with the flavonoid fraction.]

Maikai, V.A., Maikai, B.V. and Kobo, P.I. 2009. Antimicrobial properties of stem bark extracts of *Ximenia americana*. Journal of Agricultural Science (Toronto) 1(2): 30-34. [Extracts of *X. americana* showed activity against *Escherichia coli, P. aeruginosa, Staphylococcus aureus, P. vulgaris* and *B. subtilis*, supporting their traditional use against microbial infections in Nigeria.]

Malabrigo, P.L., Jr. 2010. *Rafflesia banaoana* (Rafflesiaceae): another new species from Luzon, Philippines. Asia Life Sciences - The Asian International Journal of Life Sciences Suppl.4: 139-146. [*R. banaoana* is described as a new species from Kalinga Province, Northern Luzon. It was compared to *R. mira*, *R. speciosa* and *R. baletei*, but was not compared to *R. leonardi*. Subsequently, Barcelona *et al*. (Phytotaxa 24:11-18, 2011) – see Huastorium 59 - showed that this taxon and *R. leonardi* are conspecific, thus *R. banaoana* is a later synonym.]

Marion, D., Simier, P., Delavault, P., de Zélicourt, A., Letousey, P., Thoiron, S., Campion, C., Simoneau, P. and Elmorjani, K. 2007. Ha-DEF1, a sunflower defensin, induces cell death in *Orobanche* parasitic plants. Planta 226(3): 591-600.

Martín-Santamaría, S. and 14 others. 2011. Symmetric dithiodigalactoside: strategic combination of binding studies and detection of selectivity between a plant toxin and human lectins. Organic & Biomolecular Chemistry 9(15): 5445-5455. [Including lectin from *Viscum album*.]

Martínez-Bonfil, B.P., Salcedo-Morales, G., López-Laredo, A.R., Ventura-Zapata, E., Evangelista-Lozano, S. and Trejo-Tapia, G. 2011. Shoot regeneration and determination of iridoid levels in the medicinal plant *Castilleja tenuiflora* Benth. Plant Cell, Tissue and Organ Culture 107(2): 195-203. [Describing a means of propagating *C. tenuifolia*, of value as a medicinal plant in Mexico.]

Mat Salleh, K., Mahyuni, R., Susatya, A. and Veldkamp, J.F. 2011. *Rafflesia lawangensis* (Rafflesiaceae), a new species from Bukit Lawang, Gunung Leuser National Park, North Sumatra, Indonesia. Reinwardtia 13: 159-165. [This taxon, *R. lawangensis*, was previously thought to be *R. arnoldi*, but it differs from it in a number of characters. It resembles *R. kerrii* in possessing a very wide diaphragm opening, but differs from that species in lacking windows in the diaphragm.]

Mehjabeen, Mansoor Ahmad, Noor Jahan, Zia-ul-Haq, M., Alam, S.M., Asma Wazir and Saeedul-Hassan 2011. Antimicrobial screening of some plants of medicinal importance. Pakistan Journal of Botany 43(3): 1773-1775. [Showing some antifungal activity in extracts of *Cuscuta reflexa.*]

Memon, A.H., Rind, F.M.A., Laghari, M.G.H., Mughal, U.R., Memon, N., Almani, F. and Khuhawar, M.Y. 2010. Study of folk recipes and ethnomedicinal uses of thirty medicinal plants of district Umerkot, Sindh, Pakistan. Hamdard Medicus 53(1): 127-135. [Mention of *Cuscuta reflexa* included.]

Mendes, F.R. 2011. Tonic, fortifier and aphrodisiac: adaptogens in the Brazilian folk medicine. Revista Brasileira de Farmacognosia 21(4) 754-763.

[*Ptychopetalum olacoides* (Olacaceae) among species regarded as 'adaptogens'.]

Menkir, A . 2011. Effect of genetic divergence of *Striga hermonthica* (Delile) Benth.-resistant maize inbred lines on heterosis and hybrid performance under parasite pressure. Crop Science 51(4): 1591-1602. [Conluding that selection for inbreds with greater levels of resistance to *S. hermonthica* appears to be more effective for developing resistant hybrids than selection of parental pairs based on genetic distance alone.]

Mignouna, D.B., Manyong, V.M., Mutabazi, K.D.S. and Senkondo, E.M. 2011. Determinants of adopting imazapyr-resistant maize for Striga control in Western Kenya: a double-hurdle approach. Journal of Development and Agricultural Economics 3(11): 572-580. [Based on the same survey as the following item, concluding that age of the household head, household size, membership to social group, access to extension services and perception towards IR maize for *Striga* control were found to influence the decision to adopt the technique.]

Mignouna, D.B., Mutabazi, K.D.S., Senkondo, E.M. and Manyong, V.M. 2011. Imazapyr-resistant maize technology adoption for witch weed control in western Kenya. African Crop Science Journal 19(3): 173-182. [Discussing the extension techniques for promotion of herbicide-treated maize for control of *Striga hermonthica*.]

*Mitra, P., Chang KyuSeob and Yoo DaeSeok. 2011. Kaempferol extraction from *Cuscuta reflexa* using supercritical carbon dioxide and separation of kaempferol from the extracts. International Journal of Food Engineering 7(4): Article 9. (http://www.bepress.com/ijfe/vol7/iss4/art9/)

Mondani, F., Golzardi, F., Ahmadvand, G., Ghorbani, R. and Moradi, R. 2011. Influence of weed competition on potato growth, production and radiation use efficiency. Notulae Scientia Biologicae 3(3): 42-52. [*Orobanche aegyptiaca* included among major weeds of potato (in Iran) but no specific mention in text.]

Mony, R., Dibong, S.D., Ondoua, J.M. and Bilong, C.F.B. 2011. Study of host-parasite relationship among Loranthaceae flowering shrubs-myrmecophytic fruit trees-ants in Logbessou District, Cameroon. Annual Review & Research in Biology 1(3): 68-78. [Noting that some ant species nested in the dead suckers of unspecified Loranthaceae.]

Mora, F.D., Ríos, N., Rojas, L.B., Díaz, T. Velasco, J., Carmona A.J. and Silva, B. 2011. Chemical composition and *in vitro* antibacterial activity of the essential oil of *Phthirusa adunca* from Venezuelan andes. Natural Product Communications 6(7): 1051-1053. [Oil from *P. adunca* showed activity against *Salmonella typhi*, *Staphylococcus aureus*, *Enterococcus faecalis*, *Escherichia coli* and *Klebsiella pneumoniae*.]

Mothana, R.A.A., Al-Said, M.S., Al-Rehaily, A.J., Thabet, T.M., Awad, N.A., Lalk, M. and Lindequist, U. 2012. Anti-inflammatory, antinociceptive, antipyretic and antioxidant activities and phenolic constituents from *Loranthus regularis* Steud. ex Sprague. Food Chemistry 130(2): 344-349. [Three quercetin-related flavonoid glycosides with anti-inflammatory and anti-oxidant properties were identified from *L. regularis (= Phragmanthera regularis*), supporting its traditional medicinal use in the Arabian Peninsula.]

Moupela, C., Vermeulen, C., Daïnou, K. and Doucet, J.L. 2011. (African walnut (*Coula edulis* Baill.). An unknown non-timber forest product.) (in French) Biotechnologie, Agronomie, Société et Environnement 15(3): 485-495. [In addition to its edible fruits, *C. edulis* ((Coulaceae) has potential for its termite resistant timber.]

Muhammad Altaf Hussain, Muhammad Qayyum Khan, Nazar Hussain and Tariq Habib. 2011. Antibacterial and antifungal potential of leaves and twigs of *Viscum album* L. Journal of Medicinal Plants Research 5(23): 5545-5549. [Comparing different solvents for the extraction of active materials from *V. album*.]

Muhammad Jamil. 2011. The relationship between strigolactones and *Striga hermonthica* infection in cereals. PhD Thesis, Wageningen University, Wageningen, The Netherlands, 192 pp. [Showing good correlation between strigolactones and *Striga* germination across a range of strigolactone levels achieved using strigolactone biosynthesis inhibitors, genetic variation and fertilizer (N and P) application. See full abstract under Thesis above.]

Muhammad Saeed, Marwat, K.B. and Bakhtiar Gul. 2011. Occurrence of different weeds in canola: a survey of farmers in District Swat-Pakistan. Pakistan Journal of Weed Science Research 17(1): 25-31. [*Orobanche* spp. were recorded as serious weeds in canola and tobacco, causing up to 50% yield losses.]

Mullaj, A., Shehu, J., Tan Kit and Imeraj, A. 2010. New records for the Albanian flora. Botanica Serbica 34(2): 163-167. [Including *Orobanche rechingeri*.]

Mulvey, R.L. and Hansen, E.M. 2011. *Castilleja* and *Pedicularis* confirmed as telial hosts for *Cronartium ribicola* in whitebark pine ecosystems of Oregon and Washington. Pathology 41(6): 453-463. [Confirming that *Pedicularis racemosa* and *P. bracteosa* and *Castilleja applegatei*, *C. miniata*, *C. parviflora* and *C. arachnoidea* were, or could be, infected by the rust *Cronartium ribicola* and that there is sufficient time for *C. ribicola* to complete its life cycle on these hosts.]

Murage, A.W., Obare, G., Chianu, J., Amudavi, D.M., Pickett, J.A. and Khan, Z.R. 2010. Duration analysis of technology adoption effects of dissemination pathways: A case of 'push–pull' technology for control of *Striga* weeds and stemborers in Western Kenya. Crop Protection 30(5): 531-538. [Uptake of the 'push-pull' technique for control of *S. hermonthica* was promoted best by field days and farmer teachers. Other favourable factors were education, household size and high-income level.]

Mwakaboko, A.S. and Zwanenburg, B. 2011. Single step synthesis of strigolactone analogues from cyclic keto enols, germination stimulants for seeds of parasitic weeds. Bioorganic & Medicinal Chemistry 19(16): 5006-5011. [Describing a range of new strigolactone analogues with high activity stimulating seeds of *Striga* and *Orobanche* spp.]

Mwakaboko, A.S. and Zwanenburg, B. 2011.
Strigolactone analogs derived from ketones using a working model for germination stimulants as a blueprint. Plant Cell Physiol 52(4): 699-715. [Describing a range of compounds with appreciable germinating activity on *Striga hermonthica*, *Orobanche crenata* and *O. cernua*. Stereoisomers having the same configuration at the D-ring as in naturally occurring strigol have a higher stimulatory effect than the corresponding antipodes. The analogs obtained from 1-indanone and 1-tetralone have an activity comparable with that of the well known stimulant GR 24.]

Mythili, S., Sathiavelu, A. and Sridharan, T.B. 2011. Antimicrobial activity of selected Indian folk medicinal plants. Journal of Pharmacy Research 4(6): 1894-1898. [Reporting inhibition of *Klebsiella pneumoniae* by extracts of *Cassytha filiformis*.]

Ndambi, B., Cadisch, G., Elzein, A. and Heller, A. 2011. Colonization and control of *Striga hermonthica* by *Fusarium oxysporum* f. sp. *strigae*, a mycoherbicide component: an anatomical study. Biological Control 58(2): 149-159. [*F. oxysporum strigae* (Foxy 2) controls *S. hermonthica* by i) complete digestion of parasite seedlings inside the host and ii) clogging of vessels of emerged plants by hyphae, contributing to wilting and subsequent death.]

Nicácio, J.N., Uchôa, M.A., Faccenda, O., Guimarães, J.A. and Marinho, C.F. 2001. Native larval parasitoids (Hymenoptera) of frugivorous Tephritoidea (Diptera) in South Pantanal Region, Brazil. Florida Entomologist 94(3): 407-419. [In *Ximenia americana* ((Ximeniaceae)) 14% of the larvae of the tephritid *Anastrepha* spp. were parasitized by the braconid *Doryctobracon areolatus* which reached more than 96% of total parasitism in this host fruit.]

Njume, C., Afolayan, A.J. and Ndip, R.N. 2011. Diversity of plants used in the treatment of *Helicobacter pylori* associated morbidities in the nkonkobe municipality of the Eastern Cape province of South Africa. Journal of Medicinal Plants Research 5(14): 3146-3151. [*Hydnora africana a*mong 17 plant species used as a remedy for stomach ulcers.]

Nobre, C.,E.B. and Schlindwein, C. 2011. New records for species of *Theope* (Lepidoptera, Riodinidae) for the state of Pernambuco and northeastern Brazil, with notes on their natural history. Revista Brasileira de Entomologia 55(2): 275-278. [*Schoepfia guianensis* (Schoepfiaceae) noted as the probable host of *Theope terambus*.]

Noumi, E. and Ebwelle, E.S. 2011. Potentiality of medicinal plants in treating urinary lithiasis in Littoral Region, Cameroon. European Journal of Medicinal Plants 1(3): 74-87. [*Coula edulis* (Coulaceae) among plants used traditionally.]

Nowak, B., Pineault-Molenat, D., Boulet, C. and Leflon, M. 2010. (Impact of catch crops on the evolution of broomrape's seed bank.) (in French) 21ème Conférence du COLUMA. Journées Internationales sur la Lutte contre les Mauvaises Herbes, Dijon, France, 8-9 Décembre, 2010: 247-255. [Noting increasing importance of *O. ramosa* on oilseed rape in the Poitou-Charentes area, and the lack of good control methods. Suggesting that catch crops of mustard or oilseed rape decrease the seed bank by 30% and can be combined with chemical control.]

O'Connell, J.M., Sandler, H.A., Adler, L.S. and Caruso, F.L. 2011. Controlled studies further the development of practical guidelines to manage dodder (*Cuscuta gronovii*) in cranberry production with short-term flooding. Renewable Agriculture and Food Systems 26(4): 269-275. [Results suggest flooding does not reduce germination of *C. gronovii* but delays stem growth and may be best applied some time after germination.]

Ogechukwu, O.E., Ogoamaka, O.P., Sylvester, N.C., Kawamura, A. and Proksch, P. 2011. Immunomodulatory activity of a lupane triterpenoid ester isolated from the eastern Nigeria mistletoe, *Loranthus micranthus* (Linn). Asian Pacific Journal of Tropical Medicine 4(7): 514-522. [Findings support the ethnomedicinal use of *L. micranthus* (= *Ileostylus micranthus*) in the management of diseases affecting the immune system, perhaps due to the effect of triterpenoid(s) on splenocytes and IL-8 receptor expression.]

Ogola, J.B.O. and 10 others. 2009. Effects of green manure legumes on striga infestation in maize. Aspects of Applied Biology 96: 259-262. [In a field trial in South Africa mucuna, lablab, sunhemp and cowpea grown for a season prior to maize did not affect emergence or biomass of *S. asiatica* but gave increased crop yield comparable to those from nitrogen.]

Okubamichael, D.Y., Griffiths, M.E. and Ward, D. 2011. Host specificity, nutrient and water dynamics of the mistletoe *Viscum rotundifolium* and its potential host species in the Kalahari of South Africa. Journal of Arid Environments 75(10): 898-902. [*V. rotundifolium* parasitises only *Ehretia rigida* and *Ziziphus mucronata* at this site though these were not the commonest or tallest trees available.]

Okubamichael, D.Y., Rasheed, M.Z., Griffiths, M.E. and Ward, D. 2011. Avian consumption and seed germination of the hemiparasitic mistletoe *Agelanthus natalitius* (Loranthaceae). Journal of Ornithology 152(3): 643-649. [Seven bird species recorded feeding on fruits of *A. natalitius* in South Africa.]

Olabissi, O.A. Moussa, O., Moustapha, O. Edgard, Z.F., Eléonore, K. Marius, L. and Pierre, G.I. 2011. Acute toxicity and anti-inflammatory activity of aqueous ethanol extract of root bark of *Ximenia americana* L. (Olacaceae). African Journal of Pharmacy and Pharmacology 5(7): 806-811. [Aqueous ethanol extracts of root bark of *X. americana* possess anti-inflammatory properties, inhibiting oedema, pain, cell migration and increased vascular permeability.]

Olakojo, S.A. and Olaoye, G. 2011. Correlation and heritability estimates of maize agronomic traits for yield improvement and *Striga asiatica* (L.) Kuntze tolerance. African Journal of Plant Science 5(6): 365-369. [Confirming that genotypic and phenotypic correlation coefficients as well as heritability estimates were found suitable as models for yield improvement and selection for *S. asiatica*-tolerant genotypes in Nigeria.]

Oyetayo, O.V. 2011. Antimicrobials from wild edible plants of Nigeria. Natural antimicrobials in food safety and quality. In: Rai, M. and Chikindas, M. (eds) Natural antimicrobials in food safety and quality. CABI, Wallingford, UK. pp. 261-276. [Reviewing the antimicrobial properties of a range of plants including *Tapinanthus dodoneifolius*.]

Pattanayak, S.P. and Mazumder, P.M. 2011. Therapeutic potential of *Dendrophthoe falcata* (L.f) Ettingsh on 7,12-dimethylbenz(a)anthracene-induced mammary tumorigenesis in female rats: effect on antioxidant system, lipid peroxidation, and hepatic marker enzymes. Comparative Clinical Pathology 20(4): 381-392. [Results suggests that extracts of *D. falcata* show antioxidant activity and play a protective role against DMBA-induced breast carcinogenesis.]

Panetta, F.D., Cacho, O., Hester, S., Sims-Chilton, N. and Brooks, S. 2011. Estimating and influencing the duration of weed eradication programmes. Journal of Applied Ecology 48(4): 980-988. [A model predicts a minimum 22 years for eradication of *Orobanche ramosa* from the infested area in Australia with 62 years being a more realistic estimate. Also discussing ways in which eradication might be hastened.]

Peng Liang (and many others). 2011. (Influences of herba cistanche tea on the ability of anti-fatigue and anoxia endurance in mice.) (in Chinese) Modern Preventive Medicine 38(12): 2362-2364. [Extracts of *Cistanche* prolonged the swimming time of mice, increased their hepatic glycogen reserve and decreased their lactic acid after swimming.]

Pickett, J.A. and Hooper, A.M. 2011. Delivering resistance to a major constraint for rain-fed rice production. New Phytologist 192(4): 792-794. [Useful commentary on two papers in this issue of New Phytologist on pre- and post-attachment resistance in the New Rice for Africa (NERICA) cultivars by Cissoko *et al*. and Jamil *et al*. (see listed above.]

Pooja Sinoriya, Irchhaiya, R., Bhawna Sharma, Gayatri Sahu and Santosh Kumar. 2011. Anticonvulsant and muscle relaxant activity of the ethanolic extract of stems of *Dendrophthoe falcata* (Linn. F.) in mice. Indian Journal of Pharmacology 43(6): 710-713. [Concluding that extracts of *D. falcata* do have anticonvulsant and muscle relaxant activity.]

Poudel, A. and 11 others. 2011. Antioxidative and antiobesity activity of Nepalese wild herbs. Natural Product Sciences 17(2): 123-129. [Extracts of *Cuscuta reflexa* showed potent antioxidant activity.]

Pradeep Kumar, Madhu Kamle and Jagtar Singh 2011. Biochemical characterization of *Santalum album* (Chandan) leaf peroxidase. Physiology and Molecular Biology of Plants 17(2): 153-159.

Prandi, C., Occhiato, E.G., Tabasso, S., Bonfante, P., Novero, M., Scarpi, D., Bova, M.E. and Miletto, I. 2011. New potent fluorescent analogues of strigolactones: synthesis and biological activity in parasitic weed germination and fungal branching. European Journal of Organic Chemistry 20/21: 3781-3893. [The synthesis of new fluorescent analogues of strigolactones is reported allowing the introduction of various substituents on the A and C rings. Their biological activity was assessed with seeds of *Orobanche aegyptiaca* and the AM fungus *Gigaspora margarita*.]

Priti Soni and Sikarwar, R.L.S. 2011. Pharmacopoeial standardization of *Alectra chitrakutensis* (M.A. Rau.) R. Prasad & R.D. Dixit found in Chitrakoot Region. Journal of Natural Remedies 11(2): 124-131. [A preliminary study of the possible active ingredients of the endangered medicinal herb *A. chitrakutensis*.]

Qaiser, M., Tahmeena Siddiqui and Shaukat, S.S. 2011. Two new species of *Euphrasia* (Orobanchanceae) from Pakistan and adjoining areas. Pakistan Journal of Botany 43(4) 1809-1818. [Morphological analysis of the *Euphrasia densiflora* and *E. jaeschkei* complexes has led to description of the new species *E. omeri* and *E. alii*.]

Qasem, J.R. 2011. Parasitic flowering plants of woody species in Jordan. European Journal of Plant Pathology 131(1): 143-155. [85 woody plant species belonging to 33 botanical families are recorded being parasitised by species of *Cuscuta*, *Orobanche*, *Cistanche*, *Plicosepalus*, *Viscum*, *Osyris* and *Cynomorium*. Including some new host records.]

Ramadan, M.F., Hefnawy, H.T.M. and Gomaa, A.M. 2011. Bioactive lipids and fatty acids profile of *Cistanche phelypaea*. Journal für Verbraucherschutz und Lebensmittelsicherheit 6(3): 333-338. [Major components of oil from *C. phelypaea* included oleic, palmitic and linoleic acids, β-sitosterol, and α and β-tocopherol.]

Rampratap Meena, Meena, A.K., Mageswari, S., Ramaswamy, D. and Khan, S.A. 2010. Evaluation of pharmacopoeial standards with reference to aftimoon-whole plant (*Cuscuta reflexa* Roxb.). International Journal of Pharmaceutical Sciences and Research (IJPSR) 1(11): 139-141. [Describing the methods for analysing products based on *C. reflexa*, of local importance for treatment of insanity, melancholia, melanous, epilepsy, numbness, paralysis, facial palsy, arthritis, worm infestation, jaundice and in the weakness of liver, stomach and spleen.]

Rawsthorne, J., Watson, D.M. and Roshier, D.A. 2011. Implications of movement patterns of a dietary generalist for mistletoe seed dispersal. Austral Ecology 36(6): 650-655. [Studies of the movement of spiny-cheeked honeyeater *Acanthagenys rufogularis* showed that it might disperse seeds of *Amyema quandang* (Loranthaceae) up to 700m away.]

*Riley, K. L. and Chastagner, G.A. 2011. First report of *Phytophthora ramorum* infecting mistletoe in California. Plant Health Progress PHP-2011-0209-02-BR. (http://www.plantmanagementnetwork.org/php/elements/sum.aspx?id=9402&photo=5200) [Unspecified mistletoe (*Phoradendron serotinum?*) infesting black walnut was found to be a host for *P. ramorum*, the cause of Sudden Oak Death.]

Robles-Zepeda, R.E., Velázquez-Contreras, C.A., Garibay-Escobar, A., Gálvez-Ruiz, J.C. and Ruiz-Bustos, E. 2011. Antimicrobial activity of Northwestern Mexican plants against *Helicobacter pylori*. Journal of Medicinal Food 14(10): 1280-1283. [Among 17 local plants used traditionally for gastrointestinal problems, extracts from *Krameria erecta* (Krameriaceae) were among those causing at least 50% inhibition of *H. pylori*.]

Rodenburg, J. and Bastiaans, L. 2011. Host-plant defence against *Striga* spp.: reconsidering the role of tolerance. Weed Research (Oxford) 51(5): 438-441. [Emphasising the potential value of combining tolerance with resistance (including as insurance against breakdown of resistance) but noting the difficulty of screening for tolerance in resistant material. Suggesting approaches to the identification and exploitation of genes for tolerance.]

Rodenburg, J., Zossou-Kouderin, N., Gbèhounou, G., Ahanchede, A., Touré, A., Kyalo, G. and Kiepe, P. 2011. *Rhamphicarpa fistulosa*, a parasitic weed threatening rain-fed lowland rice production in sub-Saharan Africa - a case study from Benin. Crop Protection 30(10): 1306-1314. [Recording some increase in the occurrence of *R. fistulosa* (Orobanchaceae) in Benin, and farmer estimates of over 60% yield loss. Also reporting useful variations in resistance and tolerance among rice varieties, and alleviation of damage with nitrogen application.]

Roh HyunSik, Lim EuGene, Kim JinWoo and Park ChungGyoo. 2011. Acaricidal and oviposition deterring effects of santalol identified in sandalwood oil against two-spotted spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae). Journal of Pest Science 84(4): 495-501. [Among 34 oils, that from *Santalum album* had the most acaricidal and repellent effects against *T. urticae*.]

Rohilla, R., Munish Garg and Gaurav Kumar. 2011. A newly discovered phytohormone: Strigolactones. Der Pharmacia Sinica 2(4): 164-171. [A general review.]

Rösch, M. and Tserendorj, G. 2011. (A natural history study of the flora of the northern Schwarzwald region, southwestern Germany.) (in German) Hercynia 44(1): 53-71. [Pollen studies show that *Viscum album* occurred in the early Holocene but became less common after the expansion of *Abies alba*, replacing *Taxus baccata*.]

Sabbagh, S.K. 2011. Effect of GR24, a synthetic analogue of strigolactones, on gene expression of solopathogenic strain of *Sporisorium reilianum*. African Journal of Biotechnology 10(70): 15739-15743. [Reviewing the creation of functional analogs and inhibitors of plant hormones with examples of brassinosteroids, ABA biosynthesis inhibitors and regulators of strigolactone function: SL mimics, SL biosynthesis inhibitor and SL biosynthesis regulation through gibberellin.]

Saidou, A.K., Ajeigbe, H.A. and Singh, B.B. 2011. Participatory evaluation of improved cowpea lines and cropping systems for enhancing food security and income generation in Niger Republic, West Africa. American-Eurasian Journal of Agricultural & Environmental Sciences 11(1): 55-61. [Four improved cowpea varieties were inferior to local varieties under traditional cropping practice but gave 2-3 fold higher yields as sole crops or with an improved cropping system (not specified in the abstract). Two, IT97K-499-38 and IT97K-499-35, are resistant to *Striga gesnerioides*.]

Satish Patil, Sneha Anarthe, Ram Jadhav and Sanjay Surana.2011. Evaluation of anti-inflammatory

activity and *in-vitro* antioxidant activity of Indian Mistletoe, the hemiparasite *Dendrophthoe falcata* L. F. (Loranthaceae). Iranian Journal of Pharmaceutical Research 10(2): 253-259. [Extracts of *D. falcata* leaves were found to have potent anti-inflammatory and in-vitro antioxidant effects.]

Scholes, J.D., Bruce, T., Foyer, C., Halford, N., Keys, A., Kunert, K., Lawlor, D., Parry, M. and Russell, G. 2009. Unravelling the molecular basis of resistance in rice to the witchweed *Striga*. Aspects of Applied Biology 96: 77-78. [*C. campestris* accumulates much higher levels of Zn, Cu and Cd than its hosts, but also produces phytochelatins that may function to protect it from acquired toxic substances.)

Semerci, A., Kaya, Y., Peker, K., Sahin, I. and Citak, N. 2011. The analysis of sunflowers yield and water productivity in Trakya region. Bulgarian Journal of Agricultural Science 17(2): 207-217. [The adoption rates of farmers in Turkey, to new sunflower varieties including herbicide resistant (IMI) and those genetically resistant to *Orobanche cumana* are over 90%.]

Sepehr, M.F., Jameie, S.B. and Hajijafari, B. 2011. The *Cuscuta kotschyana* effects on breast cancer cells line MCF7. Journal of Medicinal Plants Research 5(27): 6344-6351. [Findings of a study in Iran suggest that the flavonoid extract of *C. kotschyana* could be useful in breast cancer treatment.]

Shefferson, R.P., McCormick, M.K., Whigham, D.F. and O'Neill, J.P. 2011. Life history strategy in herbaceous perennials: inferring demographic patterns from the aboveground dynamics of a primarily subterranean, myco-heterotrophic orchid. Oikos 120(9): 1291-1300. [Including exploration of the hypothesis that in the absence of the need to photosynthesise, sprouting of the myco-heterotrophic *Corallorhiza odontorhiza*. would be rare and would always lead to flowering.]

Shin Sun, Lee YunJung, Kim EunJu, Lee AnSook, Kang DaeGill and Lee HoSub. 2011. Effect of *Cuscuta chinensis* on renal function in ischemia/reperfusion-induced acute renal failure in rats. American Journal of Chinese Medicine 39(5): 889-902. [An aqueous extract of *C. chinensis* ameliorated regulation of the urine concentration and renal functions in rats with ischemia/reperfusion-induced acute renal failure.]

Showemimo, F.A. 2010. Effect of *Striga hermonthica* on yield and yield components of sorghum in Northern Guinea savanna of Nigeria. Journal of Plant Sciences 5(1): 86-90. [Samsorg-17 and Samsorg-3 are identified as potential sources of resistance/tolerance to *Striga hermonthica*.]

Shuka, L., Malo, S. and Tan, K. 2011. New chorological data and floristic notes for Albania. Botanica Serbica 35(2): 157-162. [Including a new record for *Pedicularis ernesti-mayeri*.]

Sodde Vijay, Dashora Nipun, Prabhu Kirti and Lobo Richard. 2011. Antioxidant activities of methanolic and aqueous extract of *Macrosolen parasiticus* (L.) Danser. International Journal of Research in Ayurveda and Pharmacy (IJRAP) 2(1): 207-210. [Results suggest that extracts of *M. parasiticus* could be a source of natural antioxidant in preventing age-associated oxidative stress-related degenerative diseases.]

Sodde, V., Dashora, N., Prabhu, K.S. and Lobo, R. 2011. Evaluation of anticancer activity of *Macrosolen parasiticus* (L.) Danser on Ehrlich's ascites carcinoma treated mice. International Journal of Cancer Research (USA) 7(2): 135-143. [Demonstrating that extracts of *M. parasiticus* have potent anticancer activity comparable to that of cisplatin.]

Soliman, I.E. and Hamza, A.M. 2010. Evaluation of some herbicides against flax dodder (*Cuscuta epilinum* Weihe) in fibre flax (*Linum ustatissimum* L.) cultivation. Journal of Plant Protection Research 50(3): 372-378. [In field trials in Egypt, butralin gave the best control of *C. epilinum* followed by metosulam, tribenuron-methyl and fluazifop-p-butyl. All increased flax yield.]

Soro, K., Soro, D., N'Guessan, K., Gnahoua, G.M. and Traoré, D. 2011. (Loranthaceae parasitism on rubber in the forest zone of the sub-prefectures of Gagnoa and Ouragahio, Cote d'Ivoire.) (in French) Journal of Animal and Plant Sciences (JAPS) 6(1): 597-604. [Surveying the occurrence of *Phragmanthera capitata*.]

Start, A.N. 2011. Fire responses and survival strategies of mistletoes (Loranthaceae) in an arid environment in Western Australia. Australian Journal of Botany 59(6): 533-542. [One species (unspecified!) recovered from fire by resprouting. Twelve others reduced fire risk by varying degrees of host specificity, favouring hosts that grew in fire-sheltered sites while 2 other species grew on fire-vulnerable hosts in fire-prone grasslands but had very low host specificity, increasing the likelihood that imported seed would be deposited on suitable hosts.]

Stefanova, N.A., Fursova, A.Zh., Sarsenbaev, K.N. and Kolosova, N.G. 2011. Effects of *Cistanche deserticola* on behavior and signs of cataract and retinopathy in senescence-accelerated OXYS rats. Journal of Ethnopharmacology 138(2): 624-632. [Noting beneficial effects of *C. deserticola* extracts on age-related behavioral decline, cataract and retinopathy.]

Suchinina, T.V. and Petrichenko, V.M. 2011. Seed oil fatty acid composition of some *Euphrasia* species (*Scrophulariaceae*). Rastitel'nye Resursy 47(3): 97-102. [Nine fatty acids were identified in oils from 7

Euphrasia ssp., mainly unsaturated linolenic, linoleic and oleic acids, in Perm region of Russia.]

Sule, T.T., Avav, T. and Shave, P.A. 2008. Distribution and intensity of *Striga* in Benue State, Nigeria. Nigerian Journal of Weed Science 21: 4-11. [A survey of 1250 fields found 97% infested by *S. hermonthica* on maize, sorghum and rice and on 4 grass weed species.]

Sunita Shailajan and Harshvardhan Joshi. 2011. Optimized separation and quantification of pharmacologically active markers quercetin, kaempferol, β-sitosterol and lupeol from *Cuscuta reflexa* Roxb. Journal of Pharmacy Research 4(6): 1851-1853.

Sunita, P., Pattanayak, S.P. and Oraon, A. 2010. Pharmacognostic studies on leaves of *Dendrophthoe falcata* (L.f) Ettingsh. Hamdard Medicus 53(1): 106-112. [Reporting mostly morphological features.]

Szeto YimTong, Wong ChingYee, WaiMing and Pak SokCheon. 2011. *In vitro* antioxidation activity and genoprotective effect of selected Chinese medicinal herbs. American Journal of Chinese Medicine 39(4): 827-838. [None of the studied products including that based on *Cuscuta* showed activity in the 'comet' test for protection of DNA from oxidant challenge by hydrogen peroxide.]

Tájek, P. 2000. (Flora and vegetation of the Vřesovec - an important serpentinite locality of the Mnichovské hadce region.) (in Czech) Erica (Plzeň) 17: 33-50. [Including observations on *Pedicularis sylvatica* (in Czech Republic).]

Tehmina Asmat, Khan, M.A., Mushtaq Ahmed, Muhammad Zafar, Fouzia Manzoor, Mamoona Munir, Kulsoom Akhtar, Shazia Bashir, Tehmeena Mukhtar, Madiha Ambreen and Abbasi, S.N. 2011. Pollen morphology of selected species of Scrophulariaceae of District Dir Upper, Pakistan. Journal of Medicinal Plants Research 5(28): 6423-6428. [In a study of 9 species, pollen grains were usually radially symmetrical, isopolar, oblate-spheroidal or prolate-spheroidal or sub-prolate, tricolporate and psilate, except *Pedicularis oederi* (the only parasitic sp. included) which has bisyncolpate pollen.]

Telli, S. Üremiş, İ. 2010. (Plant protection problems and recommendations for their solutions in parsley production in Samandağ (Hatay).) (in Turkish) Ziraat Fakultesi Dergisi, Mustafa Kemal Universitesi 15(1): 39-48. [*Orobanche aegyptiaca* and *O. ramosa* among the most important weeds of parsley.]

Těšitel, J., Lepš, J., Vráblová, M. and Cameron, D.D. 2011. The role of heterotrophic carbon acquisition by the hemiparasitic plant *Rhinanthus alectorolophus* in seedling establishment in natural communities: a physiological perspective. New Phytologist 192(1): 188-199. [Shading *R. alectorolophus* reduced growth when young but had less effect later. Shading increased the proportion of carbon acquired from the host, up to 50%.]

Tesso, T.T. and Ejeta, G. 2011. Integrating multiple control options enhances *Striga* management and sorghum yield on heavily infested soils. Agronomy Journal 103(5): 1464-1471. [In field experiments in Ethiopia, a resistant variety gave the greatest reduction in emergence of *S. hermonthica* but only a modest increase in crop yield. Tied ridges and N fertilizer alone did not reduce *Striga* emergence but the combination of all 3 inputs increased crop yield by 121%.]

Thomson, F.J., Moles, A.T., Auld, T.D. and Kingsford, R.T. 2011. Seed dispersal distance is more strongly correlated with plant height than with seed mass. Journal of Ecology (Oxford) 99(6): 1299-1307. [*Striga hermonthica* was the species with the smallest mass per seed among the 211 species studied.]

Tilk, M., Mandre, M., Klõšeiko, J. and Kõresaar, P. 2011. Ground vegetation under natural stress conditions in Scots pine forests on fixed sand dunes in southwest Estonia. Journal of Forest Research 16(3): 223-227. [*Melampyrum pratense* among commonest species under *Pinus sylvestris* on lower dunes.]

Tiwari, C.K., Nidhi Sharma, Verma, R.K. and Jamaluddin. 2009. Screening of *Ganoderma lucidum* isolates by using cellulolytic adequacy index. Journal of Tropical Forestry 25(1/2) 66-71. [*Santalum album* among the wood types involved in the study.]

Tomilov, A., Tomilova, N. and Yoder, J.I. 2007. *Agrobacterium tumefaciens* and *Agrobacterium rhizogenes* transformed roots of the parasitic plant *Triphysaria versicolor* retain parasitic competence. Planta 225(5): 1059-1071.

Tsialtas, J.T. and Eleftherohorinos, I.G. 2011. First report of branched broomrape (*Orobanche ramosa*) on oilseed rape (*Brassica napus*), wild mustard (*Sinapis arvensis*), and wild vetch (*Vicia* spp.) in northern Greece. Plant Disease 95(1): 1322. [Infestation of oilseed rape by *O. ramosa*, causing estimated 30-60% yield loss, apparently associated with infestation of tobacco on this land 20 years previously.]

Tsuboi, Y., Doi, T., Matsunami, K., Otsuka, H., Shinzato, T. and Takeda, Y. 2011. Gallates of isoorientin and (2*S*)-1,2-propanediol glucoside from the leaves of *Schoepfia jasminodora*. Journal of Natural Medicines 65(3/4): 617-622. [Two new galloyl esters from *S. jasminodora* (Schoepfiaceae) showed radical scavenging activity.]

Ueno, K., Fujiwara, M., Nomura, S., Mizutani, M., Sasaki, M., Takikawa, H. and Sugimoto, Y. 2011. Structural requirements of strigolactones for

germination induction of *Striga gesnerioides* seeds. Journal of Agricultural and Food Chemistry 59(17) 9226-9231. [Optically active (8b*R*,2′*R*)-isomers of 4-hydroxy-GR24 and 4-acetoxy-GR24 induced germination of *Striga gesnerioides*, but the racemic diastereomers did not. The stereoisomer of GR24 with the same configuration induced negligible germination. Some of the compounds tested were effective antagonists of induction of seed germination by cowpea root exudate. An oxygenated substituent at C-4 and the configuration of the C-and D-ring are essential structural requirements for induction of germination in *S. gesnerioides* seeds.]

Ueno, K., Nomura, S., Muranaka, S., Mizutani, M., Takikawa, H. and Sugimoto, Y. 2011. *Ent*-2′-*epi*-orobanchol and its acetate, as germination stimulants for *Striga gesnerioides* seeds isolated from cowpea and red clover. Journal of Agricultural and Food Chemistry 59(19): 10485-10490. [Confirming the identity of stimulants for *S. gesnerioides* and indicating that the acetate may be the same as that previously described as alectrol.]

Urmilesh Jha and Tushar, T.S. 2011. Hepatoprotective activity of hydroalcoholic extract of *Cuscuta reflexa* Roxb in paracetamol intoxicated albino rats. International Journal of Research in Ayurveda and Pharmacy (IJRAP) 2(4): 1290-1293. [Suggesting that the hepatoprotective activity of *C. reflexa* may be due to normalization of impaired membrane function activity.]

Vaishali Patil. 2011. Pharmacognostical study on the seed of *Santalum album* Linn. International Journal of PharmTech Research 3(3): 1600-1602. [A preliminary study.]

van Deenen, N., Prüfer, D. and Gronover, C.S. 2011. A latex lectin from *Euphorbia trigona* is a potent inhibitor of fungal growth. Biologia Plantarum 55(2): 335-339. [Including reference to agglutinin from *Viscum album* var. *coloratum*.]

van Hoveln, M.D., Evans, B.A. and Borowicz, V.A. 2011. Hemiparasite - host plant interactions and the impact of herbivory: a field experiment. Botany 89(9): 537-544. [In a study of four clipping treatments (none, early, late, early and late) on *Schizachyrium scoparium*, the impact of *Pedicularis canadensis* (Orobanchaceae) and clipping on host growth were independent, but clipping altered the value of the host to the parasite.]

van Mourik, T.A., Stomph, T.J. and Murdoch, A.J. 2011. Purple witchweed (*Striga hermonthica*) germination and seedbank depletion under different crops, fallow, and bare soil. Weed Biology and Management 11(2): 100-110. [Similar results were obtained by seed bag and soil sampling techniques used to assess seed loss of *S. hermonthica* in the field in Mali and Nigeria. Greatest losses were by germination under susceptible cereal crops. Losses lower under non-host crops, fallow and bare soil.]

Varga, I, Poczai, P. and Taller, J. 2011. Biological control of common mistletoe (*Viscum album* L.) with hyperparasitic fungus. Abstract presented at 3rd International Symposium on Environment and Invasive Plants. Ascona, Switzerland, October, 2011. European Weed Scierce Society. (http://www.ewrs.org/doc/EWRS_Invasive_Ascona_Abstracts_2011.pdf) [Reporting culture techniques for use of the fungus *Phaeobotryosphaeria visci* for control of *V. album*.]

Vermaak, I., Kamatou, G.P.P., Komane-Mofokeng, B., Viljoen, A.M., Beckett, K., van Wyk, B.E. and Viljoen, A. 2011. African seed oils of commercial importance - cosmetic applications. South African Journal of Botany 77(4): 920-933. [Reviewing the cosmetic applications, physico-chemical properties, oil composition and biological activity of 6 commercially important species including *Ximenia americana*.]

Vicaș, S.I., Rugină, D. and Socaciu, C. 2011. Comparative study about antioxidant activities of *Viscum album* from different host trees, harvested in different seasons. Journal of Medicinal Plants Research 5(11): 2237-2244. [Noting differences in antioxidant activity of extracts of *V. album* according to the host *Acer campestre*, *Fraxinus excelsior*, *Populus nigra*, *Malus domestica* or *Robinia pseudoacacia*, and season]

Vijay Sodde, Nipun Dashora, Kirti Prabhu, Bhagat Jaykumar and Richard Lobo. 2011.Histological and physico-chemical studies of *Macrosolen parasiticus* (L.) Danser Stem - a common parasitic medicinal plant. Der Pharmacia Sinica 2(1): 217-221. [*M. parasiticus* (Loranthaceae) stem extracts exhibited moderate free radical scavenging activity.]

Vivika Meltsov, Anneli Poska, Odgaard, B.V., Sammul, M. and Kull, T. 2011. Palynological richness and pollen sample evenness in relation to local floristic diversity in southern Estonia. Review of Palaeobotany and Palynology 166(3/4): 344-351. [*Melampyrum* among the species recorded.]

Vurro, E., Ruotolo, R., Ottonello, S., Elviri, L., Maffini, M., Falasca, G., Zanella, L., Altamura, M.M., di Toppi, L.S., di Toppi, L.S. and Meharg, A.A. 2011. Phytochelatins govern zinc/copper homeostasis and cadmium detoxification in *Cuscuta campestris* parasitizing *Daucus carota*. Environmental and Experimental Botany 72(1): 26-33. [*C. campestris* accumulates much higher levels of Zn, Cu and Cd than its hosts, but also produces phytochelatins that may function to protect it from acquired toxic substances.)

Wagner, H., Scheer, R., 2011. Mistletoe in Tumour Therapy. Basic Research and Clinical Practice. In:

Wagner, H. and Scheer, R. (eds) Proceedings of the 5th Mistletoe Symposium, Nonnweiler - Otzenhausen, Germany, 10-12 November 2011. Phytomedicine 18(Supplement VIII): S1-S28. [See Meeting Report above.]

Wang WanLin, Wang JiYun, Chen AiLian, Hu YuKun and Liu YanYan. 2010. (Study of *Pedicularis verticillata*'s chemical control.) (in Chinese) Xinjiang Agricultural Sciences 47(6): 1242-1247. [Concluding that MCPA was ideal for control of *P. verticillata* in alpine grassland.]

Wang XiaoMei, Zhang Qian, Rena, K., Wang XinLing and Wang XiaoQing. 2011. (Chemical constituents in whole plant of *Cynomorium songaricum*.) (in Chinese) Zhongcaoyao = Chinese Traditional and Herbal Drugs 42(3): 458-460.

Waters, M.T., Smith, S.M. and Nelson, D.C. 2011. Smoke signals and seed dormancy: Where next for MAX2? Plant Signaling and Behaviour 6(9): 1418-1422. [The *Arabidopsis thaliana* protein MAX2 has roles in leaf senescence, seedling photosensitivity, shoot outgrowth, and seed germination. MAX2 mediates specific responses to both strigolactones and karrikins. Putative Orobanchaceae MAX2 orthologs form a sub-clade distinct from those of other dicots, suggesting that lineage-specific evolution of MAX2 may have given rise to specialized responses to these signaling molecules.]

Watson, D.M., McGregor, H.W. and Spooner, P.G. 2011. Hemiparasitic shrubs increase resource availability and multi-trophic diversity of eucalypt forest birds. Functional Ecology 25(4): 889-899. [Plots of *Eucalyptus camaldulensis* with an under-story of *Exocarpos strictus* (Santalaceae) were richer in arthropod and bird species than equivalent plots with an under-story of non-parasitic *Acacia dealbata*.]

Welsh, A.B. and Mohamed, K.I. 2011. Genetic diversity of *Striga hermonthica* populations in Ethiopia: evaluating the role of geography and host specificity in shaping population structure. International Journal of Plant Sciences 172(6): 773-782. [All 12 populations of *S. hermonthica* from 4 host crops were distinct when compared using AFLP. Differences were greatest with geographic distance rather than host species.]

White, B.L.A., Ribeiro, A.de S., White, L.A.S. and do Nascimento Júnior, J.E. 2011. Analysis of the incidence of mistletoes in the Sergipe Federal University, São Cristóvão Campus. Floresta 41(1): 1-8. [*Struthanthus vulgaris* (Loranthaceae) occurred on 4 exotic tree species. *S. polyrrizus* occurred only on the native *Anacardium occidentale*.]

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HAUSTORIUM 60

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