# HAUSTORIUM

## *Parasitic Plants Newsletter*

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## PRESIDENT'S MESSAGE

Dear IPPS members,
I am very pleased to announce that we had an excellent meeting at the 13th World Congress on Parasitic Plants, held from July 5 to 10 in Kunming, China. More than 100 participants from around the world really enjoyed the science, social activities, beautiful food and drink, in typical Chinese surroundings. I would like to extend grateful thanks to Ai-Rong Li, Yongping Yang, and their team for their perfect preparation, arrangements, and warm hospitality. I also thank John Yoder for his excellent job in arranging the scientific program and all session organizers for their efforts in preparation and management of sessions. All of the keynote lectures were very informative and helped us to catch up with recent advances in various research areas related to parasitic plants. In addition, oral and poster presentations were all of good quality and, in particular, those selected for student/young scientist awards were excellent.

Finally, I would like to thank all attendees for their active participation and discussions. Details of the meeting will be found in this issue. The book of abstracts and a group photo can be found on the IPPS website (http://www.parasiticplants.org ).

The IPPS executive committee members had nominated Diego Rubiales unanimously for an IPPS Honorary Fellow award, and Diego received this award at the conference dinner. We all acknowledge his great contributions to both parasitic plant science, in particular the breeding of resistant cultivars, and to IPPS. Diego was the Editor of IPPS from 2005–2010 and program chair at the 10th World Congress on Parasitic Plants (Kusadasi, Turkey).

Also at the conference dinner, we expressed our special thanks and appreciation to the two founding Editors of Haustorium and honorary members of the IPPS, Chris Parker and Lytton Musselman, for their extensive and intensive long-lasting contribution in gathering all available literature on various aspects of parasitic plants, reviewing, compiling, and distributing updated knowledge to all of us. Although they are still very active, we would like to organize a small group of IPPS members for supporting editorial works of Haustorium.

In a final session prizes were awarded for the best student oral presentations, to (1st) Zhen-Zhen Yang (student, Penn State Univ.) (2nd) Satoko Yoshida (postdoc, RIKEN) and (3rd) Song-Kui Cui (student, RIKEN) and for the best student posters, to (1st) Yasunori Ichihashi (postdoc, RIKEN) and (2nd) Chun Su (student, Univ. Verginia)

It is time to start thinking about our next congress, the 14th World Congress on Parasitic Plants. If you would like to invite our next congress to your country, please send me an e-mail notice. In addition, I welcome any suggestions and comments for possible congress venues as we would like to select a place that is most convenient to as many IPPS members as possible.

Next year, we will be holding elections to fill the offices of Vice President, Secretary, and one Member at Large. I encourage you to nominate, vote, and be active in your society. Please send me nominations for these positions.

Sincerely,

Koichi Yoneyama, IPPS President
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## MEETING REPORTS

### 13TH WORLD CONGRESS ON PARASITIC PLANTS, KUNMING, 5-9 JULY, 2015

Just about 100 delegates from at least 23 different countries met in Kunming for a wonderfully well-conducted meeting in the comfort of the Yunnan Dianchi Garden Resort Hotel.

**Molecules and Biochemistry:**
The keynote lecture in this section was by **Harro Bouwmeester** (Wageningen University, the Netherlands), on 'Structural diversity in the strigolactones: biosynthesis and biological significance'. The fact that the strigolactones play multiple roles in the rhizosphere as well as in the host plant itself seems to have resulted in the evolution of an enormous structural diversity the biological significance of which we are only just beginning to understand. The current knowledge on the biosynthesis and structural diversification of strigolactones and their perception in host and parasite and the strategy to further elucidate their biological significance was discussed. This was followed by **Koichi Yoneyama** (Utsunomiya University, Japan) discussing the 'Structure- and stereo-specific transport of strigolactones from roots to shoots.' Although it is generally accepted that strigolactones (SLs) mainly produced in roots move acropetally to shoots and inhibit axillary bud outgrowth, it was suggested that both endogenous and exogenous SLs move symplastically in plants. In addition, by using deuterium-labeled SLs, transport of root-applied SLs to shoots was found to proceed in a highly structure- and stereo-specific manner. Details of xylem sap analyses and feeding experiments were explained and discussed in relation to SL transport in plants.
**Salim Al-Babili** (KAUST, Saudi Arabia) talked on 'Carlactone: biosynthesis and application'. Carlactone is an intermediate of the strigolactone biosynthetic pathway, which is formed from all-trans-carotene by the sequential activity of the all-trans/9-cis-carotene isomerase DWARF27 and the carotenoid cleavage dioxygenaeses 7 and 8 (CCD7, CCD8). To explore the potential of this pathway in converting carotenoids other than all-trans-carotene and in producing carlactone-like compounds that might lead to other type(s) of strigolactones, the substrate specificities of the involved enzymes, using in vitro assays were

investigated. The results demonstrate that the rice -ionone ring containing bicyclic carotenoids, i.e. -carotene and –cyptoxanthin mediates the isomerization reaction in the -ionone ring containing moiety of the substrate. CCD7 enzymes show a wide substrate- and a very narrow stereo-specificity, converting different 9-cis-configured carotenoids, including 9-cis-carotene, 9-cis-zeaxanthin and 9-cis-lutein. These data indicate the possibility of the formation of hydroxylated carlactones. Initial studies showed that carlactone can induce seed germination in *Striga* at considerable levels but has largely only MAX1-dependent activity in *Arabidopsis*. Carlactone analogues exerted very high activity in inducing seed germination. However, this activity was dependent on the species. In addition, the compound showed strigolactone-like activities in *Arabidopsis.* **Alessio Cimmino** (Università di Napoli, Italy) spoke on 'Fungal and plant metabolites for the biocontrol of some parasitic plant species'. He presented an interesting approach for broomrape (*Orobanche* and *Phelipanche* spp.) and dodder (*Cuscuta* spp.) management. The possibility to use microbial or plant metabolites to stimulate and/or inhibit broomrape seed germination in the absence of the host was explored and plant and fungal metabolites also evaluated for their inhibitory effects on germination and growth of *Cuscuta* species. Isolation and chemical characterization of some plants, plant root exudates and fungal metabolites for these purposes was described.

**Rosemary Ahom** (University of Agriculture, Makurdi, Nigeria) described the identification of potential allelochemicals in velvet bean (*Mucuna cochinchinensis*) for the control of *Striga hermonthica*. Plant growth-inhibitory compounds from the roots of *M. cochinchinensis* were more active than those from leaves and seed. Six phenolic/flavonone compounds including gallic acid, caffeic acid, L-dopa, tyrosine, quercetin and isovetexin were isolated and identified in velvet bean leaves, root and seed.

**Kristen Clermont** (Virginia Tech, USA) spoke on 'Comparative metabolomic analysis of early parasite development of *Phelipanche aegyptiaca* and *Triphysaria versicolor*.' Comparative profiling of primary metabolites involved in carbon and nitrogen assimilation by the two parasites provided a rationale for targeting aspartate-family amino acid biosynthesis as a means of disrupting their growth. This work also adds metabolomic data to current Parasitic Plant Genome Project transcriptome datasets.

**Chong Yang** (Zhejiang University, China) described physiological and biochemical responses of three sunflower cultivars, TK0409 (confectionery type and susceptible), S606 (oil type and intermediate) and JY207 (oil type and resistant) differing in their sensitivity to *Orobanche cumana* infection. The effect of *O. cumana* inoculation on physiological and biochemical changes in these cultivars suggested that the enhanced plant growth, low oxidative stress, stimulated antioxidant activities, lignin and phenolic contents were associated with improved infection tolerance in cultivar JY207 as compared to TK0409 and S606. Higher concentration of phenolics and lignins in resistant cultivar JY207 was observed under *O. cumana* inoculation that may play a possible role in infection prevention.

**Relevant posters** included the identification of germination stimulants exuded by sunflower varieties differing in tolerance of *Orobanche cumana*; altitude and location effects on stimulant exudation by *Houttuynia cordata*; chemicals selectively regulating strigolactone function; possible effects of *Striga* infection on the morphology of rice via strigolactone biosynthesis or signalling pathways; and strigolactone profiles in sorghum in relation to AM fungal symbiosis.

**Genes and genomes:**

In a keynote lecture by **Jim Westwood (**Virginia Tech, USA) on 'Genome level interactions in the parasite-host complex' he noted that parasites are locked in an arms race with their hosts that drives evolution of both sides. Parasitic plants do not merely siphon off host water and nutrients, but rather have sophisticated mechanisms to redirect host resources while simultaneously subverting host defences. Recent demonstrations of parasitic plants exchanging macromolecules such as proteins and nucleic acids with their hosts suggest a novel type of interaction that greatly expands the potential mechanisms available to the parasite for host manipulation. This is especially true for *Cuscuta*, where RNA exchange includes some transmission to the host, raising the potential for regulation of host gene expression. It is suggested to consider parasites and their hosts as parts of a supra-organismal system in which the parasite-host complex is greater than the individual genetics of its members.

**Gunjune Kim** (Virginia Tech, USA) also referred to the large scale, bidirectional movement of macromolecules including mRNA, proteins and viruses between *Cuscuta* and *Arabidopsis*. Transcriptome data via Illumina sequencing from *Cuscuta* stems near the point of attachment to various hosts indicate that *Cuscuta* interacts with each different host in a specific manner and understanding the dynamics of specific interactions may advance understanding of *Cuscuta* parasitism. **Wei-Shu Fan** (Inner Mongolia University, China) described the sequencing of the complete mitochondrial and plastid genome of *Castilleja paramensis* and investigation of changes in the organelle genomes that may result from a parasitic lifestyle. *C. paramensis* appears to be the donor for a transfer event involving the atp9 and ccmFn genes into another Andean plant. The results are consistent with a reduction in photosynthetic activity but retention of full mitochondria function in *C. paramensis*. **Guang-Da** talked about using transcriptome data to assemble mitochondrial and chloroplast genes of *Cynomorium songaricum***,** a parasitic plant occurring across China, Mongolia and Central Asia which is used as a medicinal herb. Its hosts are mainly *Nitraria* spp. The data were used to assemble unigenes of the mitochondrial and chloroplast genes.

**Ken Shirasu** (Riken, Japan) gave a keynote lecture on 'Vascular hijack by parasitic plants'**.** Understanding the mechanisms underlying the hijacking process, involving the haustorium, is an important step to develop a strategy to fight against the weedy parasites. Next-generation

sequencing and bioinformatics, as well as genetic analyses revealed the dynamic reprogramming of the parasite cells upon infection. The molecular mechanisms behind the uniqueness of parasitic plants was discussed. **Hailey Larose** (Virginia Tech, USA) described pre- and post-germination transcriptome analysis and presented findings of genes expressed during the break from dormancy of *O. cumana* and *O. cernua*. These were sequenced and differential expression analysis performed between the various stages. **Guiling Sun** (Kunming Institute of Botany) studied the horizontal transfer of novel Class II hAT transposons from Brassicaceae to root parasitic Orobanchaceae. This first case of a class II transposon laterally transferred among eudicots was characterized, and it was suggested to be involved with direct transport of DNAs through haustoria, followed by the insertion catalyzed by the transposase itself. **Zhen-Zhen Yang** (Pennsylvania State University, U.S.A.) spoke on 'Comparative transcriptome analyses reveal core parasitism genes and suggest gene duplication and repurposing as sources of structural novelty'**.** The genetic basis for the evolution of haustoria was studied by comparative transcriptome sequencing in three species of Orobanchaceae. Newly identified 'parasitism genes' were identified, most of them derived from gene duplications in a common ancestor of Orobanchaceae and the related non-parasitic *Mimulus guttatus*. Additionally, the signature of relaxed purifying selection and/or adaptive evolution at specific sites was detected in many haustorial genes, and may play an important role in parasite evolution. **Xin-Hua Zhang** (South China Botanical Garden, China) talked on transcriptome profiling during haustorium development in *Santalum album***.** A combination of next-generation sequencing and cytomorphological studies was used to identify changes in gene expression and metabolic pathways associated with the development of the *S. album* haustorium. *S. album* obtains some of its water and simple nutrients by tapping into host roots. A substantial number of the identified differentially expressed genes were involved in cell wall metabolism and protein metabolism, as well as mitochondrial electron transport functions. Phytohormone-mediated regulation was also found to play an important role during haustorium development.

**Host parasite interactions:**

**Julie Scholes** (University of Sheffield, UK) delivered a key note lecture focused on 'Deciphering the molecular mechanisms of resistance to parasitic plants'. Studies have been focused on the identification of mechanisms and genes underlying resistance (and susceptibility) in cereal hosts to different ecotypes and species of *Striga* with the aim of designing novel control strategies and/or breeding durable defence against these parasites. Mapping populations has helped identify a highly significant Quantitative Trait Locus (QTL) underlying the resistance phenotype that contains many orthologs of disease resistance genes, while use of a range of comparative genomic and molecular approaches helps to identify which of the candidate gene(s) is/are responsible for the resistance phenotype.

**Suo Qiu** (University of Sheffield, UK) talked on 'Understanding the genomic basis of virulence in the parasitic weed *Striga hermonthica'*. A population genomic approach were taken to locate virulence loci within the *S. hermonthica* genome that allow parasites to overcome host resistance genes. Differences in allele frequencies between the *Striga* plants growing on two contrasting rice cultivars were compared at Single Nucleotide Polymorphism (SNP) level and at the gene level. SNP analyses revealed that many genes were highly significantly differentiated between the *Striga* individuals growing on the susceptible and resistant cultivars and are therefore excellent candidates for virulence determinants. **Xiao-Yan Jia** (Virginia Tech, USA) studied pectin methylesterases (PME) which are secreted by parasitic plant intrusive cells during invasion and were hypothesized to facilitate penetration. From transcriptomic data analyses of Parasitic Plant Genome Project (PPGP), two orthogroups of pectin methylesterase inhibitor (PMEI) unigenes were identified showing specific upregulation in the penetration stage of all three parasities *Phelipanche aegyptiaca*, *Triphysaria versicolor* and *Striga hermonthica*. Preliminary data showed that PaPMEI1 ectopic expression in *Arabidopsis* plants exhibited an aerial rosette phenotype when grown under short day condition. PaPMEI1-OX lines retained ability to host *P. aegyptiaca* growth and no significant morphological difference was observed in parasite development compared to those inoculated on wild type plants. **Loren Honaas** (Pennsylvania State University, USA) discussed 'Risk versus reward' in *Triphysaria versicolor*, a facultative parasite and a model plant for parasitic Orobanchaceae. In a study of host-dependent growth patterns host-dependent phenotypes displayed by the parasite provided insight into reproductive strategies and host choice mechanisms in this species. **Muvari Connie** (University of Massachusetts, USA) described a greenhouse study showing that cultivars of cranberry varied in overall levels of some phenolics but not in phytohormone levels but also that Tjiurutue gypsy moth damage delays parasite attachment, indicating that a host plant's single interaction with one herbivore species can alter subsequent interactions with a prevalent parasitic plant, broadening our knowledge about community dynamics. **Jianqiang Wu** (Kunming Institute of Botany, China) showed that host mRNAs and proteins can be translocated to *Cuscuta australis* and that when one soybean plant is attacked by *Spodoptera litura*, certain systemic signals are induced and transmitted to both *C. australis* and another soybean host via the *C. australis*. These signals induce increased levels of jasmonic acid-isoleucine conjugates in the first soybean plant but not in *C. australis*. This and RNA-seq analysis revealed that the *Cuscuta* mediates inter-plant signalling and may provide hosts with certain fitness advantages by sending 'insect attack' alerts from infested to non-infested systemic plants. **Petra Světlíková** (Kunming Institute of Botany, China) described macro- and microscopic observations of hydathode trichomes on the leaves of *Rhinanthus alectorolophus*. Gas-exchange measurements were combined to find a correlation among guttation, respiration,

and transpiration, a pattern attributable to active water secretion. The observations reveal water secretion from the glandular trichomes present on the abaxial leaf side. Based on the carbon budget calculations, a potential role of the trichomes in the evolution of holoparasitism within the clade is proposed. **Satoko Yoshida** (RIKEN, Japan) described a model plant system using the facultative parasite *Phtheirospermum japonicum*. The hairy root transformation system allowed visualization of expression of cell marker genes and plant hormone responsive genes by *in vivo* imaging. Transcriptome analysis was done to identify genes expressed during haustorium formation. Reverse genetic studies using RNAi techniques revealed that auxin-biosynthesis gene YUC3 is involved in haustorium formation. Furthermore, the genome of *P. japonicum* was sequenced for comparative analyses with obligate parasites and non-parasitic plants. Mutant collections from *P. japonicum* ethyl methanesulfonate (EMS)-mutagenized lines also revealed possible genetic components involved in plant parasitism. **Pradeepa Bandaranayake** (University of Peradeniya, Sri Lanka) described 'Functional characterization of haustorial hair development in *Triphysaria versicolor'*. Twenty-two genes whose mutations in *Arabidopsis* lead to changes in root hair phenotypes, including hairless roots and changes in root hair number, morphology, position and length, were selected for this study. Current results identifying parasite genes that function in haustorial hair development using RNAi technology were discussed. **Song-Kui Cui** (RIKEN, Japan) talked about 'Haustorial hairs are controlled by root hair genes and involved in parasitism'. From a forward genetic screening with EMS (ethyl methanesulfonate)-mutagenized *P. japonicum* seeds 3 lines of mutants lacking haustorial hairs were isolated. These mutants also lack root hairs, suggesting that haustorial hairs are controlled by genetic components involved in root hair development. Indeed, PjEXP18, the orthologous gene to *Arabidopsis* root hair specific EXPA18, was expressed in both root hairs and haustorial hairs, suggesting similar genetic identity. All three mutants show reduced number of haustoria upon host rice root infection, suggesting a role of haustorial hairs on the efficient host detection or host attachment. The genes responsible for the mutants may be involved in host signal perception. **Vincent Goyet** (University of Nantes, France) discussed haustorium formation in the obligatory parasitic plant *Phelipanche ramosa*. Papillae were induced in *P. ramosa* germinating seeds upon treatment with biological extracts. Seeds with these structures showed a significantly higher infection rate on *Brassica napus* roots compared to untreated germinating seeds. *P. ramosa* seeds displaying pre-haustorium structures were taken for transcriptomic approaches using a *P. ramosa* microarray. As a complementary approach, a functional validation approach based on fast calli generation from *P. ramosa* germinating seeds was developed.

**Relevant posters** included identification of parasite effectors mediating *Striga gesnerioide*-host plant interactions; a comparison of the mitochondrial genomes of *Cistanche* spp.; horizontal gene transfer between *Cistanche deserticola* and its host; the mitochondrial gene sequence and gene transfer in *Cynomorium* spp.; the molecular basis for the convergent evolution of parasitism; and the evolution and expression profile of transcription factors in three Orobanchaceae.

A paper on economic losses from parasitic weeds in rice in Africa by **Jonne Rodenburg** (Africa Rice Centre, Tanzania) was presented by Julie Scholes. Estimates suggest that up to 2.5 million farmers are suffering up to 2.5 million tons in lost yield. At least 40% of rice crops may be infested by *Striga* species causing 40-70% yield loss worth $26-160 million. *Rhamphicarpa fistulosa* is becoming increasingly serious and causing comparable losss. Countries most seriously affected include Guinea, Cote d'Ivoire, Nigeria, Uganda, Tanzania and Madagascar. **Roshanizah Rosli** (Universiti Brunei, Darussalaam) described the occurrence of *Cassytha filiformis* in Brunei on at least 24 species in 5 families. Germination and penetration were described and it is shown to reduce photosynthesis in its hosts. **Mohammed Zaroug**, (University of Gezire, Egypt) described the severe damage to carrots caused by infestation by *Cuscuta campestris*. **Bo Xia** (Shenyang Agricultural University, China) reported on the serious damage caused by *Arceuthobium sichuanense* on *Picea* species. Reductions in needle size and shoot length were more serious in *P. crassifolia* than in *P. purpurea*, the damage being caused apparently by competition for nitrogen and for water.

A keynote paper by **Danny Joel** (Newe Ya'ar Research Center, Israel) described the interesting transition of *Orobanche cumana* from wild hosts to sunflower in Russia and its subsequent spread to most other sunflower-growing regions, including Israel in the 1970s, where it damages the very susceptible confectionery sunflower crop. Over the years there has been the gradual development of a form infesting tomato which is now widespread and severe. This may be the result of some hybridisation with *O. cernua*. Ahmed Uludag presented a paper by **Filiz Arsian** (GAP Research Institute, Turkey) exploring the possible effects of climate change and concluding that *Orobanche, Philpanche, Striga* and *Viscum* problems could all be increased in the future. **Gen-Sheng Bao** (Lanzhou University, China) gave the first of several papers and posters on *Pedicularis kansuensis* increasingly infesting high altitude pastures on the Quinghai-Tibetan plateau. This contribution showed that grasses and legumes were the main hosts, their suppression allowing an increase in species richness. Lytton Musselman presented a paper by **Jay Bolin** *et al.* (Catawba College, North Carolina, USA) describing the interesting genera *Hydnora* and *Prosopanche* (Hydnoraceae). The nomenclature is clarified, host range, varying smells and pollination systems, some involving endothermy, described. Also a probable new species from Dhofar, Oman. Curiously no seed has ever been persuaded to germinate. Curious and varied pollination systems in the Balanophoraceae were also the theme of the paper by **Nina Hobbhahn** (University of Capetown, South Africa). Motion sensitive cameras showed that *Mystropetalon thomii* is pollinated by 4 different mammals, attracted to the

copious sweet nectar while the foul-smelling *Sarcophyte sanguinea* attracts beetles and insects who achieve pollination without receiving any reward. Nina also treated us to illustrations of many other exotic and colourful Balanophoraceae and what is known of their varied pollination strategies.

**Posters** related to this topic included one rather surprisingly showing arbuscular mycorrhiza stimulating *Striga hermonthica* rather than reducing it. Several others concerned various aspects of the *Pedicularis kansuensis* problem - on its relationship with AM fungi, one on root morphology, others on genetic variation and on soil nutrient status. A final one described techniques for cultivation of the medicinally important *Cistanche deserticola.*

**Control and Management:**

The final day began with a keynote lecture from **John Pickett** (Rothamsted Research, UK) providing us with a history and update on the companion-cropping ('push-pull') technique for *Striga hermonthica* control developed by ICIPE in Kenya and now being used by many thousand farmers in East Africa. Latest work is with the more drought-tolerant *Desmodium incanum* and *D. intortum*, allowing wider use, especially in sorghum. The technique is also working well on *S. asiatica*. Understanding of the active substances involved (C-linked glycosides of apigenin) and the genes involved in their synthesis is allowing exploration of their possible transfer to cowpea and other legumes, which could lead to control of other Orobanchaceae.

A further keynote presentation by **Joseph Hershenhorn** (Newe Ya'ar Research Center, Israel) reviewed the mechanism of action of the amino-acid inhibiting herbicides – glyphosate, sulfonyl ureas and imidazolinones in controlling *Orobanche* and *Phelipanche* spp. It had previously been assumed that the parasites acquired all their nutrition including amino-acids from their hosts, but it is now confirmed that they do have their own amino-acid biosynthesis mechanisms and that it is disruption of these in the parasite that is responsible for their control.

**Yongqing Ma** (Northwest A&F University, China) showed how successful use of alternative crops as trap-crops can depend on the varieties used. Varieties of wheat, maize, cotton, soyabean, rice, switchgrass and millet varied in the quantity and type of strigolactones exuded and gave very different results in the germination of *Orobanche* spp.

**Yakkov Goldwasser** (Hebrew University of Jerusalem, Rehovot, Israel) had studied the application of granular combinations of trifluralin, pendimethalin and isoxaben for control of *Cuscuta campestris* in tomato, chickpea and watermelon. Application of pendimethalin prior to *C. campestris* germination gave best results. **Joseph Hershenhorn** (Newe Ya'ar Research Center, Israel) indicated that the current methods for control of *Phelipanche aegyptiaca* in tomato in Israel depend on a complex, delicate sequence of chemical treatments and showed that repeated overall application of the established and inexpensive growth regulator, maleic hydrazide, provided excellent selective control and is currently being registered for use in Israel. **Musa Kolo** (Federal Unversity of Technology, Minna, Nigeria) had tested *Hyptis suaveolens, Senna obtusifolia* and *Desmodium intortum* as intercrops, within row, in maize grown on ridges and recorded significant delays in emergence of *Striga hermonthica* and 50% increases in crop yield. **Peter Toth** (Slovak University of Agriculture, Nitra, Slovakia) described an intriguing means of detecting the early stages of attachment of *Orobanche cumana* to the roots of sunflower by detection of volatile emissions from the leaves of the crop in response to parasite attachment, potentially allowing for suitable control methods to be applied. It has, however, yet to be confirmed that these emissions are characteristic of *Orobanche* infection and are not stimulated by other pathogens.

**Related posters** included one on control of *Orobanche cumana* by herbicide and by salicylic acid seed treatment, another on its genome sequence. One appraised the tendency to host specificity in populations of *Phelipanche ramosa* in France and another related to the difficulty of controlling *Pedicularis kansuensis* with herbicides.

**Host resistance:**

A final keynote lecture was presented by **Diego Rubiales** (Institute for Sustainable Agriculture, Cordoba, Spain) described the continuing search for good sources of resistance to *Orobanche* spp. in legume crops, noting that the parasite has been known in the Mediterranean region for over 2000 years – yet there has been no natural or human selection of crops with resistance. Some good resistance has now been found in vetch and in pea (2 cultivars are about to be released after 20 years of work) and there is some indication of a source of low-stimulant exudation in faba bean, but for many crops, alternative methods are still needed, including e.g. intercropping with fenugreek.

**Evgenia Dor** (Newe Ya'ar Research Center, Israel) described the use of chemical mutagenesis for the conversion of an established tomato variety HRT, to create HRT1, resistant to ALS-inhibiting herbicides including the imidazollinones imazapic and imazapyr. Three applications of either herbicide completely suppressed emergence of *Phelipanche aegyptiaca* resulting in a doubling of yield.

**Johann Louarn** (Laboratoire des Interactions Plantes Micro-organismes, Toulouse, France) described studies of a cross between two sunflower lines with resistance to some of the most virulent races of *Orobanche cumana*, mapping QTLs for low stimulant, incompatible attachments etc. in the diverse progeny. A final presentation by **Steven Runo** (Kenyatta University, Kenya) emphasised the continuous evolution or selection for virulence in *Striga hermonthica* in response to development of new sorghum varieties and described promising work with wild sorghum types with potentially more durable resistance.

The Abstratcts are available at:
http://www.parasiticplants.org/docs/IPPS_13th_Congress_Abstracts_Kunming_China.pdf

Hinanit Koltai and Chris Parker

**Papers and posters presented:**

**NB Only the presenter's name is included below. He/she may not always be the senior author.**

**Molecules and Biochemistry**

Harro Bouwmeester - Structural diversity in the strigolactones: biosynthesis and biological significance.

Koichi Yoneyama - Structure- and stereo-specific transport of strigolactones from roots to shoots.

Salim Al-Babili - Carlactone: biosynthesis and application.

Alessio Cimmino - Fungal and plant metabolites for the biocontrol of some parasitic plant species.

Rosemary Ahom - Identification of potential and potency of allelochemicals in velvet bean (*Mucuna cochinchinensis* (Wight) Burck) for the control of *Striga hermonthica* (Del.) Benth.

Kristen Clermont - Comparative metabolomic analysis of early parasite development of *Phelipanche aegyptiaca* and *Triphysaria versicolor.*

Chong Yang - Identification of natural germination stimulants from root exudates of sunflower cultivars differing in tolerance to *Orobanche cumana*.

Yongqing Ma - Altitude and location have more effect on contents of germination stimulants for broomrape seeds than extraction methods from the crude extracts of *Houttuynia cordata.*

Tadao Asami - Chemicals selectively regulating SL functions.

Richard Louden - Can *Striga*-induced changes to strigolactone biosynthesis or signalling pathways explain key alterations in the morphology of its rice host?

Mahdere Shimels - Strigolactone profiles in *Sorghum bicolor*: in relation to arbuscular mycorrhizal fungal symbioses.

**Genes and Genomes:**

James Westwood - Genome level interactions in the parasite-host complex.

Gunjune Kim - Cuscuta gene expression and transcript exchange varies depending on host species.

Weishu Fan - First complete mitochondrial genome from a parasitic plant (*Castilleja paramensis*).

Guangda Liu - Using transcriptome data to assemble mitochondrial and chloroplast genes of *Cynomorium songaricum.*

Ken Shirasu - Vascular hijack by parasitic plants.

Hailey Larose - Pre- and post-germination transcriptome analysis of two species of parasitic Orobanchaceae.

Guiling Sun - Novel Class II hAT transposons were laterally transferred from Brassicaceae to root parasitic Orobanchaceae.

Zhenzhen Yang - Comparative transcriptome analyses reveal core parasitism genes and suggest gene duplication and repurposing as sources of structural novelty.

Xinhua Zhang - Transcriptome profiling during haustorium development in the root hemiparasite *Santalum album* Linn.

**Host Parasite Interactions:**

Julie Scholes - Deciphering the molecular mechanisms of resistance to parasitic plants.

Suo Qiu - Understanding the genomic basis of virulence in the parasitic weed *Striga hermonthica.*

Xiaoyan Jia - Engineering host cell wall to increase resistance against *Phelipanche aegyptiaca.*

Loren Honaas - Risk versus reward: host dependent parasite phenotypes in the facultative generalist *Triphysaria versicolor.*

Muvari Tjiurutue - Gypsy moth damage delays parasite attachment to cranberry hosts.

Jianqiang Wu - Parasitic plant, *Cuscuta australis*, transmits inter-plant herbivory-induced signals.

Petra Svetlikova - The physiological role of hydathode trichomes in parasitic Orobanchaceae.

Chun Su - Identification of parasite effectors mediating *Striga gesnerioides*-host plant interactions.

Yuxia Song - Comparison of mitochondrial genomes between *Cistanche deserticola* and *Cistanche tubulosa.*

Lei Shi - A horizontal gene transfer between *Cistanche deserticola* and its host *Haloxylon ammodendron.*

Guilin Chen - Mitochondrial gene sequence analysis of parasitic plant *Cynomorium* and horizontal gene transfer study.

Yasunori Ichihashi - Molecular basis for the convergent evolution of parasitism in plants.

Yu Wang - Evolution and expression profile of transcription factor families in three parasitic plants of the Orobanchaceae .

Satoko Yoshida - Genomic and genetic analyses of haustorium formation using *Phtheirospermum japonicum* as a model parasitic plant.

Pradeepa Bandaranayake - Functional characterization of haustorial hair development in *Triphysaria versicolor.*

Songkui Cui - Haustorial hairs are controlled by root hair genes and involved in parasitism.

Vincent Goyet - Towards the understanding of haustorium formation in the obligatory parasitic plant *Phelipanche ramose.*

Girija Vijayraghavan - Host parasite interactions and nutrient dynamics of *Dendrophthoe falcata* (L.F.).

**Ecology, phylogeny and evolution:**

Jonne Rodenburg - The economic losses caused by parasitic weeds in rice in Africa.

Roshanizah Rosli - An ecophysiological study of the hemiparasitic *Cassytha filiformis* L. (Lauraceae) in Brunei Darussalam, Borneo.

Mohamed Zaroug - Field dodder (*Cuscuta campestris* Yuncker) a new pest of carrot (*Dacus carota* L.) in Gezira Scheme, Sudan.

Awad Taha - Compatibility and incompatibility of some monocotyledonous plant species to field dodder (*Cuscuta campestris* Yuncker).

Bo Xia - Impact of *Arceuthobium sichuanense* infection on needles and current-year shoots of *Picea crassifolia* and *Picea purpurea* trees.

Daniel Joel - Factors affecting host range of weedy Orobanchaceae: the *Orobanche cumana* case.

Ahmet Uludag - How climate change affects host-parasite relations and parasitic plant management.
Gensheng Bao - Effects of the hemiparasitic plant *Pedicularis kansuensis* on plant community structure in a degraded grassland.
Lytton Musselman - Taxonomy and phylogenetics of Hydnoraceae and a potentially new *Hydnora* from Oman.
Nina Hobbhahn - Pollination ecology of the South African holoparasites *Mystropetalon thomii* and *Sarcophyte sanguinea*, and diversity of pollination systems in Balanophoraceae s.l.
Salman Rahimi - Explanation of parasite association aspects in plants: game theory application in population dynamics and community structure.
Andrew McNally - Do arbuscular mycorrhizas alleviate the effect of *Striga hermonthica* on host performance?
Airong Li - AM fungi in roots of hemiparasitic *Pedicularis*: friends or foes?
Airong Li - High plasticity in root morphology of two root hemiparasitic *Pedicularis* (Orobanchaceae) species.
Yanyan Liu - Influence of soil nutrient status and plant community structure on occurrence and expansion of *Pedicularis kansuensis* in Western China.
Wenjun Li - Genetic variation and phylogeographic history of *Pedicularis kansuensis* (Orobanchaceae) inferred from chloroplast DNA Sequences.
Yuchao Chen - Pot culture of an important Chinese medicinal plant *Cistanche deserticola*.
John Pickett - Parasitic weed control: management of *Striga* spp. by companion planting with *Desmodium* spp. and opportunities for exploitation via GM.
Joseph Hershenhorn - How do amino acid biosynthesis inhibiting herbicides control broomrapes.
Yongqing Ma - A cautious conception for *Orobanche* spp. control by using allelopathy and trap crop.
Yaakov Goldwasser - *Cuscuta campestris* control with granular cell division inhibiting herbicides
Joseph Hershenhorn - Egyptian broomrape control in processing tomato with maleic hydrazide.
Musa Kolo - Use of some weed species for Witchweed (*Striga hermonthica* (Del.) Benth.) management in maize (*Zea mays* L.).
Peter Toth - How to detect crop infestation by broomrapes long before than they appear aboveground?
Luyang Hu - Role of herbicides and salicylic acid in controlling obligate root parasite *Orobanche cumana* growth in host crop sunflower.
Stephane Munos - Towards the genome sequence of *Orobanche cumana.*
Philippe Simier - Genetic diversity and host preference in the parasitic weed *Phelipanche ramosa* L. Pomel'
Xiaolin Sui - Efforts taken in the control of weedy *Pedicularis kansuensis* in China.
Diego Rubiales - Resistance to broomrape in legume crops.
Evgenia Dor - Broomrape management with a novel tomato mutant line resistant to acetolactate synthase (ALS) inhibiting herbicides.
Johann Louarn - Genetic characterization of the interaction between sunflower and *Orobanche cumana.*
Maina (Steven) Runo - *Striga*/sorghum arms race during domestication as revealed by dual RNA-seq.

**Post-Congress field tour**

The advertised post-Congress tour had to be cancelled for lack of takers but four of us were immensely fortunate that Prof Ai-Rong Li and Prof Kai-Yun Guan were prepared to arrange an alternative botanical excursion with vehicle and student guides, following much the same itinerary. First to Lijiang where we were joined by Dr ZhiFa Chen, local staff-member of the Kunming Institute of Botany who guided us to their Field Station at 3,200 m (10,500 ft). From there we climbed on foot to 3,700 m (12,000 ft) enjoying the varied flora including many parasitic, weedy, beautiful and interesting species, all patiently identified for us by Dr Chen. Among the parasitics was an abundance of *Pedicularis* species (China has 363 species), especially the magnificent and common *P. rex* Among the beautiful were meadows covered with *Primula conspersa.* On the way down the mountain we stopped at 2,700 m to collect the mistletoe *Taxillus caloreas* causing significant damage to the pine *Pinus amandii*. The next day we drove from Dali up onto Cangshan mountain, again to 3,200 m. On the way the roadside was often dominated by the introduced *Eupatorium adenophorum* (*Chromolaena adenophora*) well-known in this region for killing horses. Higher up, again plenty of *Pedicularis* spp. Among other interesting species was the small blue-flowered *Gentiana panthaica* whose flowers closed within 30-60 seconds of any disturbance. (blowing or shaking).


*Pedicularis rex*


*Taxillus caloreas*

We are profoundly grateful to all those who made this trip possible – Profs Ai-Rong Li and Kai-Yun Guan for their detailed arrangements, to Xiao-Lin Sui and Lei Xiang for their patient attendance on us, to Dr Chen for his expert botanical help and not least to our very able driver, Yun Liang.

Chris Parker, Peter Toth, Ahmed Uludag, John Yoder

**THE 1ST INTERNATIONAL CONGRESS ON STRIGOLACTONES, WAGENINGEN, THE NETHERLANDS, 1-6 MARCH 2015,**

From 1-6 March 2015 the Laboratory of Plant Physiology of Wageningen University hosted the 1st International Congress on Strigolactones in collaboration with the COST action STREAM, funded by the European Commission. The local organising committee consisted of Harro Bouwmeester, Rina Anthonijsz, Henk Hilhorst, Sander van der Krol and Carolien Ruyter-Spira. The meeting was sponsored by Syngenta, the Royal Academy of Sciences of the Netherlands (KNAW), the Wageningen University and Research Center LEB foundation, and COST action STREAM. The program of the meeting covered all the important areas in the research on strigolactones, Each session featured a number of invited speakers, leaders in their respective fields and a number of speakers were selected from the submitted abstracts, all together offering a rich program with 45 talks and 60 poster presentations. Special attention was paid to poster viewing. Posters were on display throughout the entire meeting, with selected poster viewing and flash presentations scheduled every day. Four posters got special awards for best poster in a number of categories. The meeting was attended by 135 participants.

In the first session on **Biosynthesis and transport** the advances on the biosynthesis of strigolactones were reported by Shinjiro Yamaguchi, Salim Al-Babili, Philip Brewer and Zhang Yanxia. Exciting is the discovery of strigolactone-like, carlactone-derived, compounds that do not have the characteristic B and C-ring but nevertheless exhibit biological activity. As discussed by Shinjiro Yamaguchi, this was first discovered in *Arabidopsis* but now seems to be a common phenomenon in other plant species as well. The core biosynthetic pathway of strigolactones and strigolactone-likes is now elucidated up to carlactone (Salim Al-Babili) and the strigolactone-like carlactonoate (Shinjiro Yamaguchi) and towards the canonical strigolactones, 4-deoxyorobanchol and orobanchol in rice (Zhang Yanxia). However, questions remain with regard to the role of LBO, a strigolactone(-like) biosynthetic enzyme with unknown function (Philip Brewer), how the methoxy group is introduced and what the role is of diverse decorations of other canonical strigolactones as well as strigolactone-likes. The work of Enrico Martinoia on the transport of strigolactones begins to shed light on directional internal transport of strigolactones as well. After their discovery of PDR1 as strigolactone exporter they now showed that PDR1 is also localised acropetally in root cells, suggesting that in the root tip the transporter is involved in acropetal transport of strigolactones.

In the session **Perception of strigolactones and downstream signaling** an update was given on the state-of-the-art with regard to strigolactone perception and binding by D14 (Kimberley Snowden, Yoshiya Seto), the subsequent binding of SL/D14 to the $SCF^{MAX2}$ complex which then targets SMAXL proteins for ubiquination and proteasome mediated destruction (Jiayang Li, Stephanie Kerr). Interestingly, both the signaling molecule and the receptor of SL are subject to signaling related turnover (Pilar Cubas). A strong case was made for true targets of strigolactone signaling based on multiple complementary evidence (Tom Bennett). An interaction between strigolactones and auxin and cytokinins links to flavonol formation, which in turn affects lateral root development (Sofie Goormachtig)

In the session **Chemistry of strigolactones**, Binne Zwanenburg gave an overview of this field and his contribution to it in the past 20 years. As an example of biology-guided synthesis of strigolactone analogs Tadao Asami presented their work on the optimisation of strigolactone analogs using binding to D14 to guide the synthesis. An important tool in the characterisation of the strigolactone receptors is the use of fluorescent strigolactone analogs, which was discussed by Cristina Prandi and Francois-Didier Boyer. The latter presented a molecule that will fluoresce only upon hydrolysis by the D14 receptor. Claudio Screpanti discussed the possibilities to use strigolactone analogs in agriculture while Antonio Evidente discussed alternatives for strigolactones that can be extracted from fungi and plants.

In the session **Strigolactones in plant development**, Ottoline Leyser and Christine Beveridge presented their progress on, respectively, the understanding of the role of strigolactones and carbohydrate signalling in the regulation of the oldest known developmental process controlled by strigolactones, shoot branching. Hinanit Koltai and Soizic Rochange presented the role of strigolactones in the regulation of root architecture and leaf serration, while Thomas Greb, Yasmine Ligerot discussed the role of downstream targets (SMXLs), auxin in the regulation of plant development by strigolactones. Alexander van der Krol presented a role for strigolactones in plastidial stromule formation, which turns out to be independent of the conventional role of MAX2 in strigolactone signaling.

Martin Parniske and Kohki Akiyama introduced the session **Strigolactones and AM fungi** with, respectively, presentations on the wider molecular dialog between plants and fungi and the role of strigolactones in this dialog. The session continued with presentations on the role of abiotic stress on the plant-AM interaction and the role of strigolactones in this (Juan Antonio Lopez-Raez) and the molecular mechanisms involved in plant-AM interaction (Eloise Foo, Caroline Gutjahr).

In the session **Evolution of strigolactones** the speakers tried to tie together the evidence we have from several different systems about how strigolactones and

strigolactone signalling may have evolved. Steven Smith approached this question with a comparison between karrikin and strigolactone signalling, while Catherine Rameau presented the results they have on strigolactone signalling in *Physcomitrella patens*. Along the latter line, Sandrine Bonhomme and Mauricio Lopez-Obando discussed the role of MAX2 and D14-LIKE1s in *P. patens*. Shigeoh Toh and Evgenia Dor discussed the involvement of strigolactones in germination of non-parasitic and parasitic plants, respectively.

The discussion on the role of strigolactones in germination in parasitic plants was continued in the session **Strigolactones and parasitic plants** in which Koichi Yoneyama first reviewed the role of natural strigolactones in parasitic plant germination. Subsequently, Peter McCourt and David Nelson discussed the evidence that D14-LIKE1 homologs in parasitic plants seem to have evolved to detect strigolactones in the exudates of their hosts. Jean-Bernard Pouvreau discussed the mechanism by which strigolactones induce germination in parasitic plants through catabolism of ABA in which DNA methylation seems to play a role. Yukihiro Sugimoto described the identification of the sunflower strigolactone, heliolactone, with an intriguing strigolactone-like structure. Radi Aly and Stefano Pavan subsequently described approaches using genetic modification and selection, respectively, to breed crops that have reduced strigolactone secretion and hence display resistance towards parasitic plants.

**Poster awards:** The Syngenta-sponsored poster award of €500,= for the best poster on the possible application of strigolactones in agriculture was awarded to Ivan Visentin for his poster entitled Strigolactones as root-to-shoot signals in tomato plants under osmotic stress. There were also three COST action Stream Poster awards for the best posters in three of the COST actions working groups.

**Outlook:** The meeting was very successful; there was a spirit of enthusiasm and excitement about all the important science going on in the field. In a meeting with the scientific committee during the 1st ICS we reached the conclusion that the meeting was timely and highly useful. We decided to try to organise these meetings also in the future, preferably on a regular, biannual basis. It was decided to have the 2nd ICS in Turin in spring 2017. The meeting will then be organised by Cristina Prandi and Hinanit Koltai again in conjunction with COST action STREAM.

Harro Bouwmeester
Conference Chair and Local host

**Papers presented with direct reference to parasitic plants:**

Evgenia Dor - The development of a new race of *Orobanche cumana* with a wider host range is due to changes in seed response to strigolactones.

Koichi Yoneyama - Natural strigolactones as germination stimulants for root parasitic plants.

Peter McCourt - Chemical genomics and strigolactone biology.

David Nelson - Neofunctionalization of KAI2 ligand-specificity likely enabled host-perception in parasitic weeds .

Jean-Bernard Pouvreau - DNA methylation regulates *P. ramosa* seed germination by controlling strigolactone-dependent expression of *PrCYP707A1*, an ABA catabolic gene.

Radi Aly - Enhanced host resistance to parasitic weeds by silencing and blocking key-genes involved in strigolactone pathway.

Yukihiro Sugimo to - Heliolactone, a non-sesquiterpene lactone germination stimulant for root parasitic weeds from sunflower.

Stefano Pavan - Characterization of the first pea (*Pisum sativum* L.) natural strigolactone-deficient mutant resistant to crenate broomrape (*Orobanche crenata* forsk.).

## THE 50TH ANNIVERSARY OF THE WEED SCIENCE SOCIETY OF ISRAEL, 24 FEBRUARY, 2015

On February 24, 2015 the Weed Science Society of Israel (WSSI) celebrated its 50th Anniversary on the occasion of the society's 23rd Biennial Meeting, which was held at the Faculty of Agriculture, Food & Environment of the Hebrew University of Jerusalem, in Rehovot.

The WSSI was founded by Dr. Gideon Cohen and other scientists of the Agricultural Research Organization and the Extension Service of the Ministry of Agriculture, with the original aim ‘to extend, share and distribute knowledge regarding weed control in Israel’. Since then the WSSI unites all persons who are involved in weed research and weed management in the country, including researchers, students, Extension Service personnel, experts from chemical companies, herbologists of the Plant Protection and Inspection Services, and interested farmers. One of the main characteristics of the WSSI is its intimate interaction with farmers. During its 50 years the WSSI organized hundreds of field excursions, courses and seminars.

Twenty three scientific lectures were presented in our 23rd Biennial Meeting, including four scientific sessions: Broomrape Physiology and Genetics; Ecological and Non-chemical Weed Control; Chemical Weed Control; and Weed and Crop Resistance to Herbicides. At the General Assembly a presentation about ‘Simazine, dalapon and WSSI funny stories from the 2nd Weed Control Symposium in 1966’ was given by Mr. Doron Baum (CTS group). Certificates of Honour were presented to recently retired

members. The 'Goldwasser-Zysman Student Scholarship for Advanced Studies on Parasitic Plants' was presented by Dr. Yaakov Goldwasser on behalf of his family in memory of family members who died during the Holocaust, with the aim of strengthening advanced studies on parasitic plants in modern Israel. The scholarships were awarded to Ms. Tal Shilo from Newe Yaar Research Center for her thesis 'Physiological aspects of the interaction between tomato and Egyptian broomrape' and to Mr. Amnon Kochavi from the Faculty of Desert studies at the Ben-Gurion University of the Negev, for his thesis 'The effect of abiotic stresses on broomrape-host plant interactions'.

WSSI president Mr. Shaul Graf passes the gavel to the new president Dr. Evgenia Dora

The conference ended with a formal anniversary dinner, during which WSSI members and invited guests enjoyed delicious food and made a toast in honor of the occasion. Honorary WSSI president Prof. Baruch Rubin shared his memories about his start in weed research after joining the WSSI in 1967. Dr. Tuvia Yaakobi presented a film about the use of sprayers in the late 1960$^{s}$. Ex Head of the Weed Research Department at Newe Ya'ar Research Center, Dr. Yeshayahu Kleifeld, congratulated all present WSSI members on the society's anniversary and wished WSSI 50 more years of fruitful research. Mr. Evgeny Smirnov presented a film about the history of the WSSI. The members shared joyful memories of WSSI activities.

WSSI President Evgenia Dor
Weed Research Dept., Newe Ya'ar Research Center, ARO, Israel

## THE WONDROUS *CYNOMORIUM*

Among the several thousand parasitic plants that thrive in a wide range of ecosystems, a few hold a special position, either for their scientific interest, economic importance, or historical relevance. *Cynomorium* belongs to the latter, exclusive guild.

The only genus in the family *Cynomoriaceae*, *Cynomorium* hosts two species of non-photosynthetic holoparasites growing on the roots of a variety of host plants: *C. coccineum* L., widespread in the Mediterranean region (Portugal and Spain, Italy, Greece, northern Africa) and also found in the Middle East and in the Arabian peninsula, and *C. songaricum* Rupr., which occurs in Iran, Afghanistan, China, and Mongolia (some authors consider *C. songaricum* a subspecies of *C. coccineum*).

The deep purple, fleshy flowering stems of *Cynomorium*, up to 25 cm high, emerge from a branched, subterranean and perennial rhizome. The club-shaped inflorescence bears a multitude of tiny female, male, and hermaphroditic flowers. In the case of *C. coccineum*, the stems emerge from the ground in April-May, typically associated with host plants belonging to the Chenopodiaceae, Amaranthaceae, Cistaceae and some other plant families. Recent phylogenetic studies have indicated that *Cynomorium* is not related to the tropical obligate parasites within the Balanophoraceae (which they resemble morphologically), as reported by most classifications, but rather is close to the Saxifragales (Nickrent *et al*., 2005).


*Cynomorium coccineum*. Photo: Antonio Rescigno

Both *C. coccineum* and *C. songaricum* have a long history of use in traditional medicine. In China, *C. songaricum* – known as *Suo Yang* in the Chinese Pharmacopeia – has been indicated for the treatment of impotence, premature ejaculation, kidney-*yang* deficiency, and spermatorrhea (Cui *et al*., 2013). In Saudi Arabia and bordering countries, *C. coccineum* has been known and used for centuries. Called *Tarthuth*, it was an important food source in times of famine or food shortage in desert lands, both for men and their camels, and was highly regarded in folk medicine, as a drug with aphrodisiac, spermatopoietic, tonic and astringent properties (Lebling, 2003). In the wider Mediterranean region, this plant was dubbed 'Maltese Mushroom', or 'Fungus Melitensis', owing to the fact that after learning of its curative properties from the Arabs, the Knights of Military Order of Malta introduced it in the European medical practice, and traded the plant powder for the cure

of apoplexy, dysentery, venereal diseases, ulcers, vomiting, and so on. The Knights even discovered the plant as naturally occurring in the Maltese Islands, vigorously guarding the growing sites (such as Fungus Rock, off Gozo) to protect their treasure (Lanfranco, 1960).

The large Mediterranean islands certainly make an important habitat for *Cynomorium*. Besides Malta, the plant grows on Crete, Sicily, Corsica and Sardinia. In these areas, the plant is mainly restricted to the coast or in retrodunal marshes, where it parasites halophytic plants such as *Atriplex*, *Inula*, and *Tamarix*.

Together with several colleagues, we have recently started a project aimed at the detailed characterization of the biochemical composition of *C. coccineum* as spontaneously occurring in Sardinia, and of its nutraceutical and pharmaceutical properties. In the island, this plant was traditionally used as antidiarrhoeal remedy, and for its astringent and antihemorrhagic properties (the aerial part was also a source of a dye for textiles and small wooden crafts).

In a first run of experiments, we evaluated the antioxidant potential of fresh specimens of *C. coccineum*. Both aqueous and methanolic extracts were rich in phenolics and flavonoids and showed a significant total antioxidant power, also exerting an *in vitro* protective effect in different bioassays of oxidative stress (Zucca *et al*., 2013). Further, fixed oil obtained from dried stems of the plant was able to increase the amount of essential fatty acids in normal intestinal epithelial cells (Rosa *et al*., 2012). Taken together, these data indicate the value of *C. coccineum* as a potential source of antioxidants and phytochemicals useful in the preparation of nutraceuticals and functional foods.

The fixed oil of *C. coccineum* also displayed a significant growth inhibitory effect on B16F10 melanoma and colon cancer Caco-2 cells, and even to potentiate the growth inhibitory effect of the antitumor drug 5-fluorouracil in Caco-2 cells (Rosa *et al*., 2015). Next, we attempted to assess the antifungal activity of *C. coccineum* extracts, finding that the methanolic extract was very active against *Cryptococcus neoformans*, *Candida guilliermondii* and *Candida krusei* (Gonçalves *et al*., 2015). Thus, *C. coccineum* is indeed endowed with intriguing biological activities, revealing a so far untapped potential as source of therapeutics for specific pharmaceutical applications.

'It ought to be kept in mind, that in ancient times most plants, especially aromatic species, or those that in one way or other struck man as having some peculiar shape or property, were made use of for medicinal or culinary purposes. Most of these plants, however, contain no real property able to combat ailments' warns Lanfranco in his account on *C. coccineum* (Lanfranco, 1960).

Although this is a wisely cautionary approach to the much claimed (and often non-existent) properties of plants used in traditional medicine, it seems not apply to the magnificent *Cynomorium*, which has just begun to reveal its secrets.

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## PRESS REPORTS

### Mistletoebird: Australia's native flowerpecker

Flowerpecker birds (Dicaeidae) from the tropical regions of southern Asia are pretty little songbirds that do a fantastic job at combining the drab greys, greens, olives, whites and tans of their plumage with spectacular washes of colour.

A male Mistletoebird (*Dicaeum hirundinaceum*) near Lake Ginninderra, Canberra (Credit: Duncan McCaskill)

You might be wondering why we don't just call the species the fire-breasted firepecker, which is objectively a far better name than the mistletoebird, but its relationship with mistletoe is what makes this bird so special. It feeds off the berries of the mistletoe plant, and in return for this constant food source, the birds have evolved to be the perfect carrier and distributor of the seeds within. Unlike many other birds, the mistletoebird has no gizzard - a specialised pouch behind its stomach - to grind its food, which means the fruit of the berries can be digested without the seeds inside being destroyed. According to scientists from James Cook University in Queensland, to further protect the consumed mistletoe seeds, the mistletoebird also has a modified sphincter muscle located at the base of its stomach, which can be closed to prevent the seeds from mixing with harsh digestive enzymes. This means they can basically travel all the way through the gut and be pooped out on the other side and still be fit for germination. ‘The seeds are sticky when excreted, and often several seeds are linked in a long glutinous thread, which adheres to the branch due the bird's habit of restless switching about. Which is super-gross, but kind of genius, because the seeds can stay put in the safety of mistletoe branches while they wait to be germinated, and the practice ensures a never-ending supply of mistletoe berries for the mistletoebird!

The species is found all over Australia, except in the driest parts of Tasmania. It's also native to the eastern Malauku Islands of Indonesia,

Becky Crew, Australian Geographic, 9 January, 2015

### Hunt to kill Red Witchweed drags past the 18 month mark

Canegrowers Mackay is standing firmly behind its growers impacted by notifiable pest red witchweed (*Striga asiatica*) as the time spent on finding a resolution drags past the 18 month mark. Chairman Kevin Borg said deliberations between the Federal Government and Biosecurity Queensland, and other industries potentially at risk, had been underway since the Class 1 pest was first found on Mackay region farms. ‘Since then, four cane growers and one grazier have suffered significantly through what has been a very long, drawn-out process,’ Mr Borg said. ‘The gift to these primary producers of a resolution appears to be constantly hovering on an ever-moving horizon.’

Mr Borg said a recommendation has been put forward to advise on an eradication plan for red witchweed, and Canegrowers has agreed to be a part of this with a caveat that it is finalised with a mid to end of February timeline. ‘Our growers are close to breaking point - they have lost patience, and frankly I cant blame them.’

He said he was hopeful a resolution - an effective and viable eradication and management plan - would be forthcoming by the new deadline.

Rebecca Strang, Daily Mercury
25th Jan 2015

## OBITUARIES

### DALE HESS 1954-2015

### Remembering an inspiring colleague and *Striga* expert, Dr. Dale E. Hess

Dale Hess, a passionate plant pathologist, *Striga* expert, and teacher of agro-ecology passed away on March 1, 2015, after living with cancer for three years. He left his wife Ursula, their three sons and two grandchildren behind.

Dale Hess was born June 12, 1954 in Shirati, Tanzania. Dale’s career reflected his love to his native Africa, language, people, and the environment. After graduating from Millersville State College in 1976 and serving with Mennonite Central Committee in Burkina Faso, he was introduced to the diversity of savanna plants. While working as a plant pathologist in West Africa he became acutely aware of the importance of sustainable food production systems adapted to their cultural context. He pursued a graduate degree in the plant sciences from Purdue University in 1984, and a doctoral degree from Purdue in 1989. From 1990-2001 he served as Principal Scientist in Cereal Pathology at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in West

Africa (Niger and Mali). From there he moved as Visiting Assistant Professor of Agronomy to Purdue University. For the last ten years he was employed by Goshen College (Indiana) and worked as the Ecological Field Station Director and Associate Professor of Agroecology in the Sustainability and Environmental Education Department.

During his studies at Purdue University, and as PrincipalPathologist at ICRISAT in West Africa, Dale contributed important knowledge regarding the genetic and physiological basis of *Striga hermonthica* resistance in sorghum and pearl millet, and developed promising *Striga* management strategies, including bio-control options. Among many other exciting results, he developed (in Prof. Gebisa Ejeta's group) the famous "agar-gel assay" as an easy, fast and cost-effective measure for a genotype's ability to stimulate *Striga* seed germination (Hess et al. 1992; Phytochemistry 31(2): 493-497 - cited 133 times according to Google Scholar). This assay has been used by numerous people, and has also been developed further to study additional resistance mechanisms. Meanwhile, also the first *Striga*-resistant sorghum cultivars developed by marker-assisted transfer of the resistance QTL identified under Dale's leadership in 2004 (Theoretical and Applied Genetics 109: 1005-1016) have been released by a different group in Sudan (Journal of Plant Science and Molecular Breeding, **http://dx.doi.org/10.7243/2050-2389-3-3**).

Dale was a great person, appreciated all over the world. He had excellent visions for a sustainable agriculture and shared his knowledge with many people. His work will live on, contributing to a better, more sustainable and food secure future.

Bettina Haussmann (Bettina.Haussmann@uni-hohenheim.de)

**YESHAYAHU ('SHIEKE') KLEIFELD 1934-2015**

Yeshayahu ('Shieke') Kleifeld was born in 1934 in the agricultural high school Mikve Yisrael near Tel Aviv, in which his father worked as the vegetable growing manager. One year later the family moved to Moshav Netaim in central Israel in which he worked from an early age on the family vegetable farm. From early youth he learned from his father how to grow different crops and combat their pests and weeds. At age 16 Shieke moved by himself to study at the Bet-Yerach high school near the Sea of Galilee.

Following his army service he joined Kibbutz Eyal in which he worked in the vegetable fields and citrus groves. At the age of 23 after marrying Ria, the young family left the kibbutz and Shieke went to receive his B.A. and M.Sc. in agriculture in the Hebrew University of Jerusalem and later in the Rehovot Faculty of Agriculture campus of the Hebrew University of Jerusalem. The title of his M.Sc. thesis was: 'Evaluation of herbicides for selective weed control in peanuts'. After completing his degrees he started to work as an agricultural consultant for the extension service of the Israeli Ministry of Agriculture and at the age of 30 he moved with his family to Tivon in northern Israel and joined the Newe Yaar agricultural research station of the Ministry of Agriculture. In parallel to his work he completed his PhD studies in the Hebrew University of Jerusalem and the title of his thesis being 'Elucidating the mechanism of wheat selectivity to terbutryn'. After a few years he became head of the department in which he served until his retirement at age 65. Shieke was a member of national and international weed science societies including the WSSA and a member of numerous committees of the Ministry of Agriculture including the committee for pesticide registration. Shieke served as the President of the Israeli Weed Science Society in 1981 and was granted honorary membership in 2005. He was the Editor of 'Aley Esev', the bulletin of the Israeli Weed Science society. Throughout his career he published numerous papers in local and international scientific journals.

After his retirement Shieke continued to be active as a consultant and lecturer and in recent years he developed together with the 'Netafim' drip irrigation company protocols for drip chemigation of herbicides in many crops. He conducted more than 100 field trials on this issue and his pride was the development of successful chemigation of herbicides to control broomrape in tomato and sunflower. Shieke was a 'down to earth' person with a wealth of practical knowhow in crops and weeds, extremely thorough in his research and writing and throughout his career listened to the needs of the farmers and devoted most of his time to solving their problems in the field.

Shieke died suddenly on May 5th 2015, one week before his 81st birthday in a week when he was busy with field trials and preparing a lecture on herbicide application via drip irrigation he was to present in a symposium at the same week. Shieke is survived by his wife Ria, three sons, nine grandchildren and one great granddaughter.

May he rest in peace.

Yaakov Goldwasser

## NEW JOURNAL 'ADVANCES IN PARASITIC WEED RESEARCH'

A new Frontiers journal '**Advances in Parasitic Weed Research'** has been launched 'The goal of this Research Topic is not only to present the most advanced research dealing with the management of parasitic weeds, but also to attract valuable articles on biology, physiology of parasitism, genetics, population dynamics, resistance, host-parasite relationships, regulation of seed germination, etc., in order to offer an outstanding windows to these enigmatic plants, and contribute to their practical management.'

Topic editors are Monica Fernandez-Aparichio, Maurizio Vuro and Hannan Eizenberg.

Publication fees can be as high as $1900 but reduced fees are available:

- 'Frontiers is always eager to consider solutions for any barriers to publication. In cases where authors genuinely do not have the means to pay our publishing fees, they can apply for full or partial waivers depending on the financial capability of the corresponding author of the paper. Priority is given to lower income countries, but individual limiting factors affecting the corresponding author are also taken into account. Low income countries are determined based on the following guidelines:
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For more information see: http://journal.frontiersin.org/journal/plant-science/section/crop-science-and-horticulture

## FUTURE MEETINGS

**Second International Legume Society Conference,** scheduled for 11th to the 14th October, 2016 at the Tróia resort, near Lisbon, Portugal. Papers on parasitic weeds will be welcome. For more information see: (http://www.itqb.unl.pt/meetings-and-courses/legumes-for-a-sustainable-world

## GENERAL WEB SITES

For individual web-site papers and reports see LITERATURE

For information on the International Parasitic Plant Society, past issues 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 new Frontiers Journal 'Advances in Parasitic Weed Research' see: http://journal.frontiersin.org/researchtopic/3938/advances-in-parasitic-weed-research

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 COST/STREAM conference see: http://streamisrael2013.wix.com/stream-israel-2013

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

For Access Agriculture (click on cereals for videos on *Striga*) see: http://www.accessagriculture.org/

For The Mistletoe Center (including a comprehensive Annotated Bibliography on mistletoes up to 1995, but apparently incomplete since then) see: http://www.rmrs.nau.edu/mistletoe/

For information on future Mistel in derTumortherapie Symposia see: http://www.mistelsymposium.de/deutsch/-mistelsymposien.aspx

For a compilation of literature on *Viscum album* prepared by Institute Hiscia in Arlesheim, Switzerland, see: http://www.vfk.ch/informationen/literatursuche (in German but can be searched by inserting author name).

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

## THERAPEUTIC USES OF PARASITIC PLANTS: ARE YOU INTERESTED?

The literature lists in Haustorium include a substantial proportion of papers on medicinal uses. We consider that these are relevant, and there is often useful incidental information on the distribution and other aspect of the species involved but we are seeking your help:

We would welcome comments on the usefulness of these references and whether we should continue including them. In this issue they are highlighted in blue.

Due to the a substantial proportion of papers on medicinal uses - is there someone who would like to help prepare the brief entries on these papers and guide our readers to the more important research results? Any contribution of this nature would be warmly acknowledged.

Do please respond to any of the editors listed at the end of the newsletter

## LITERATURE

***indicates web-site reference only**
**Items in bold selected for special interest**
**Items in blue relate to therapeutic uses of parasitic plants**


Abbes, Z., Mkadmi, M., Trabelsi, I., Amri, M. and Kharrat, M. 2014. *Orobanche foetida* control in faba bean by foliar application of benzothiadiazole (BTH) and salicylic acid. Bulgarian Journal of Agricultural Science 20(6): 1439-1443. [Foliar application of 1 mM salicylic acid or 0.05 g/l BTH reduced numbers and dry weight of *O. foetida* by ca. 45 and 70% respectively. Both compounds also reduced germination of *O. foetida* by 30-50%.]

Abdalla, M.M.F., Shafik, M.M. and El-Wahab, M.M.H.A. 2014. Investigations on faba beans, *Vicia faba* L. 33. Bulk vs. individual selection in variety Cairo 25 grown under *Orobanche* stress and free field. Bulletin of Faculty of Agriculture, Cairo University 65(3): 243-254. [‘Although many individual selections performed better than bulks, some bulk selections had better performance than some individual selections. Selection under *Orobanche crenata* stress condition can not be absolutely effective under stress and non stress conditions.’]

Abedi, S., Darvishzadeh, R., Bernousi, I., Mandoulakani, B.A., Maleki, H.H. and Shah, D. 2014. Genetic variability of *Orobanche aegyptiaca* infesting tobacco in Iran by Bayesian analysis. Biologia (Bratislava) 69(12): 1652-1659. [A study of genetic polymorphism among 44 *O. aegyptiaca*. individuals collected from different regions of northwest Iran using ISSR markers. Two genetic groups embraced 38 individuals with the remaining categorized as mixed genotypes.]

Abraham Yirgu, Alemu Gezahgne, Habtemariam Kassa and Minilik Tsega 2014. Parasitic plant in natural *Boswellia papyrifera* stands at Humera, Northern Ethiopia. Journal of Forestry Research 25(4): 923-928. [*B. papyrifera* is a source of frankincense. In the sample plot 38% of trees were infested by *Tapinanthus globiferus* (1-33 infections per tree) mainly on smaller branches. Other tree species were not infected.]

Acharya, B.D. 2013. Relationship between seed viability loss and seed bank reduction of *Orobanche aegyptiaca* Pers. using non-host crops. Ecoprint: An International Journal of Ecology 20: 97-106. [Field experiments in Nepal showed that over a period not defined in the abstract, the decline in viable seeds of *O. aegyptiaca* was 76%, most of this being due to edaphic factors, the trap-cropping effect contributing only 24%.]

Ac´imovic´, M., Maširevic´, S., Balaž, J., Pavlovic´, S., Oljača, S., Trkulja, N. and Filipovic´, V. 2014. (Diseases and pests of fennel.) (in Serbian) Biljni Lekar (Plant Doctor) 42(4): 286-292. [Including reference to unspecified *Cuscuta* in Serbia.]

Adeeyo, A.O., Adefule, A.K., Ofusori, D.A., Aderinola, A.A. and Caxton-Martins, E.A. 2013. Antihyperglycemic effects of aqueous leaf extracts of mistletoe and *Moringa oleifera* in streptozotocin-induced diabetes Wistar rats. Diabetologia Croatica 42(3): 81-88. [It is concluded that ‘mistletoe’ (not defined but presumably *Viscum album*) possesses hypoglycemic properties that can be very useful in the management of diabetic hyperglycemia.]

Adegbite, O.S., Akinsanya, Y.I., Kukoyi, A.J., Iyanda-Joel, W.O., Daniel, O.O. and Adebayo, A.H. 2015. Induction of rat hepatic mitochondrial membrane permeability transition pore opening by leaf extract of *Olax subscorpioidea*. Pharmacognosy Research 7(5)(Suppl.): 63-68. [Results suggest that extracts of *O. subscorpioidea* could have use in pathological conditions that require an enhanced rate of apoptosis.].

Adeoluwa, O.A., Aderibigbe, A.O. and Olonode, E.T. 2014. Antinociceptive property of *Olax subscorpioidea* Oliv (Olacaceae) extract in mice. Journal of Ethnopharmacology 156: 353-357. [Concluding that *O. subscorpioidea* possesses potent analgesic action, mediated centrally and peripherally, thus justifying its use in the management of pain.]

Alamin, M.A., Yagi, A.I. and Yagi, S.M. 2015. Evaluation of antidiabetic activity of plants used in Western Sudan. Asian Pacific Journal of Tropical Biomedicine 5(5): 395-402. [*Striga hermonthica* aqueous extract did not exert any antihyperglycemic effect to diabetic rats.]

Aldawsari, H.M., Abeer Hanafy, Labib, G.S. and Badr, J.M. 2014. Antihyperglycemic activities of extracts of the mistletoes *Plicosepalus acaciae* and *P. curviflorus* in comparison to their solid lipid nanoparticle suspension formulations. Zeitschrift für Naturforschung. Section C, Biosciences 69(9/10): 391-398. [The total extracts of *P. acaciae* and *P. curviflorus* as well as solid lipid nanoparticle formulations exhibited a significant blood glucose-lowering effect associated with antioxidant effects in diabetic rats.]

Alonso-Castro, A.J., Zavala-Sánchez, M.A., Pérez-Ramos, J., Sánchez-Mendoza, E. and Pérez-Gutiérrez, S. 2015. Antinociceptive and anti-arthritic effects of kramecyne. Life Sciences 121: 70-77. [Kramecyne, a peroxide isolated from *Krameria cytisoides* could be a good alternative for the treatment of rheumatoid arthritis due its antinociceptive and anti-inflammatory activities. From Mexico.]

Amugune, B.K., Thoithi, G.N., Mwangi, J.W., Omosa, L.K. and Kibwage, I.O. 2013.Antimicrobial activity and bioactive constituents of *Alectra sessiliflora* (Vahl) Kuntze methanol extract. East and Central African Journal of Pharmaceutical Sciences 16(3): 61-68. [Whole plant extracts of *A. sessiliflora*, used traditionally in western Kenya in the management of microbial infections. exhibited activity against bacteria *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Escherichia coli*, *Shigella dysenteriae* and *Bacillus pumilus* and fungi *Candida albicans*, *Aspergillus niger* and *Cryptococcus neoforman*, perhaps due to *p*-coumaric acid and 3,4-dihydroxybenzoic acid, and a flavonoid, luteolin.]

Anami, S.E., Zhang LiMin, Xia Yan, Zhang YuMiao, Liu ZhiQuan and Jing HaiChun. 2015. Sweet sorghum ideotypes: genetic improvement of stress tolerance. Food and Energy Security 4(1): 3-24. [Including a section on resistance to *Striga* and discussing the potential for advanced genetic manipulation involving herbicide resistance, *Desmodium* allelochemical production, RNAi constructs, strigolactone production, etc.]

Ančić´, M., Pernar, R.; Bajic´, M.; Seletkovic´, A. and Kolic´, J. 2014. Detecting mistletoe infestation on silver fir using hyperspectral images. iForest 7: 85-91. [Silver fir is an important crop in Croatia and *Viscum album* ssp. *abietis* is an increasingly serious problem accentuating other stress factors even leading to mortality. Surveying was performed using a hyperspectral scanner from a helicopter. Spectral Angle Mapper classification for 5° proved to be the best classification method. The results were confirmed by aerial surveying with a non-pilot aircraft from a height of about 30 m above the crowns. Results enable badly affected areas to be harvested early.]

Anderle, B. and Leban, V. 2014. (Novelties of flora in the Gorenjska region (northwestern Slovenia).) (in Slovenian) Hladnikia 34: 3-26. [New localities listed for *Loranthus europaeus*.]

Antonova, T.S., Strel'nikov, E.A., Guchetl', S.Z. and Chelustnikova, T.A. 2014. (A variety of sunflower broomrape forms on sunflower in the South of Russia.) (in Russian) Zashchita i Karantin Rasteniĭ 11: 45-48. [Describing a type of *O. cumana* producing multiple shoots from each tubercle and noting that some shoots had flowers developing below ground which produced viable seed.]

Anwer Shah, Bharati, K.A., Javed Ahmad and Sharma, M.P. 2015. New ethnomedicinal claims from Gujjar and Bakerwals tribes of Rajouri and Poonch districts of Jammu and Kashmir, India. Journal of Ethnopharmacology 166: 119-128. [*Balanophora involucrata* and *Cuscuta epithymum* among the most frequently quoted as useful sources, hence deserving further study.]

Anup Chandra. 2014 Infestation of *Viscum album* Linn. on *Robinia pseudo-acacia* Linn. Indian Journal of Forestry 37(3): 289-290. [Almost all *R. pseudo-acacia* were infested by *V. album* in the Rohru district of Himachal Pradesh surveyed.]

Armenia, Yuliandra, Y. and Sattar, M.Z.A. 2014. Comparative effectiveness of defatted hypotensive crude extract, ethyl acetate and butanolic fractions of *Cassytha filiformis* L. on different models of hypertensive rats. World Journal of Pharmacy and Pharmaceutical Sciences (WJPPS) 3(12): 200-208. [Results indicated that the hypotensive effectiveness of the defatted ethanolic extract of *C. filiformis* is better than its ethyl acetate or butanolic fractions and effects are greater on oxidative stress related hypertensive rats.]

Arslan, Z.F., Uludag, A. and Uremis, I. 2015. Status of invasive alien plants included in EPPO Lists in Turkey. Bulletin OEPP/EPPO Bulletin 45(1): 66-72. [*Arceuthobium* species, along with *Eichornia crassipes* are the only plant species in Turkey's quarantine list.]

Asmare Dejen. 2014. On-farm evaluation of push-pull system for stem borers and striga management on sorghum in Northeastern Ethiopia. Biopesticides International 10(2): 176-183. [Use of the push-pull system involving *Desmodium* intercrop and Napier grass surround reduced stemborer damage and emergence of *Striga hermonthica* leading to yield increases of 50-70% within one season as well as providing fodder, increasing soil fertility and reducing soil erosion.]

Atera, E.A., Onyango, J.C., Pham Thien Thanh, Ishii, T. and Itoh, K. 2015. Identification of QTL for *Striga hermonthica* resistance using backcross population derived from a cross between *Oryza sativa* (cv.

Nipponbare) and *O. rufipogon*. Journal of Agricultural Science (Toronto) 7(2): 99-105. [141 backcross recombinant inbreed lines derived from a cross between *O. sativa* (cv. Nipponbare) and *O. rufipogon* W630 were screened. A single QTL explaining 6.6% of total phenotypic variance was detected near RM242 marker locus on chromosome 9, and the Nipponbare allele was found to have *S. hermonthica* resistance.]

Aybeke, M., Şen, B. and Ökten, S. 2015. Pesta granule trials with *Aspergillus alliaceus* for the biocontrol of *Orobanche* spp. Biocontrol Science and Technology 25(7): 803-813. [Granules based on fungal mycelia/spore mixtures from liquid and solid culture, sclerotia and fungal mycelia reduced *Orobanche* infection to a greater extent when applied early and at high doses before crop sowing. Neither parasite or host species apparent from abstract.]

Aydınlı, G. and Mennan, S. 2014. Effect of some plant extracts on *Meloidogyne arenaria* Neal, 1889 (Tylenchida: Meloidogynidae) and tomato. Türkiye Entomoloji Dergisi 38(3): 323-332. [Extracts of *Viscum album* reduced galling of tomato by *M. arenaria* but concentrations were high and practical usefulness uncertain.]

Azeez, O.M. and Pitan, O.O.R. 2015. Influence of cowpea variety on the potency and deterrent indices of six plant powders against the seed bruchid, *Callosobruchus maculatus* (Fabricius) (Coleoptera: Bruchidae). Archives of Phytopathology and Plant Protection 48(5): 441-451. [*Loranthus braunii* (= *Globimetula braunii*) among species reducing oviposition by *C. maculatus* and emergence of adults. 'Powders of any of the tested plant species may be effectively exploited for bruchid control in stored cowpea grains at reduced concentration of 1.25% provided.']

Badu-Apraku, B., Fakorede, M.A.B., Oyekunle, M., Yallou, G.C., Obeng-Antwi, K., Haruna, A., Usman, I.S. and Akinwale, R.O. 2015. Gains in grain yield of early maize cultivars developed during three breeding eras under multiple environments. Crop Science 55(2): 527-539. [Varieties EV DT-W 2008 STR, 2009 DTE-Y STR Syn, and TZE-W DT C2 STR identified as the highest yielding and most stable cultivars under a range of stresses including *Striga hermonthica*.]

Bahizire Kayeye, J.L., Ndegeyi Kabale, B., Batumike Cishibanji, P., Bagalwa Mashimango, J.J., Baluku Bajope, J.P., Bashwira Sanvura, A. Basabose Kanyunyi, A. and Bagalwa, B. 2014. *In vitro* phytochemical screening and anthelmintic activity of *Viscum congolensis* and *Galiniera coffeoides* against adult earthworm *Alma emini*. International Journal of Innovation and Applied Studies 7(3): 1232-1237. ['*V. congolensis*' (= *V. congolense*?) in Congo perhaps shown to have anthelmintic activity but not clear from abstract.]

Bahraminejad, S., Amiri, R. and Abbasi, S. 2015. Anti-fungal properties of 43 plant species against *Alternaria solani* and *Botrytis cinerea*. Archives of Phytopathology and Plant Protection 48(4): 336-344. [A *Bartsia* sp. among 43 Iranian species tested but no result in abstract.]

Baird, R., Stokes, C.E., Wood-Jones, A., Alexander, M., Watson, C., Taylor, G., Johnson, K., Remaley, T. and Diehl, S. 2014. Fleshy saprobic and ectomycorrhizal fungal communities associated with healthy and declining Eastern Hemlock stands in Great Smoky Mountains National Park. Southeastern Naturalist 13(Special Issue 6): 192-218. [In the stands studied, companion species included *Pyrularia pubera* (Santalaceae).]

Bakihj Bakar, Leong SowTein, Muhammad Remy Othman, Mohamad Suffian, M.A. and Khalijah Awang. 2013. Allelochemicals in *Cuscuta campestris* Yuncker. The 4th Tropical Weed Science Conference 2013. Weed Management and Utilization in the Tropics, Chiang Mai, Thailand, 23-25 January 2013, Proceedings: 16-22. [Three compounds isolated from *C. campestris*, kaempferol4, sitosterol1 and pinoresinol2 at doses of 1-100 µM showed stimulatory effects on growth of radish, lettuce and weedy rice seedlings.]

Baki Hj Bakar, Leong SowTein, Othman, M.R., Mohamad Suffian, M.A. and Khalijah Awang. 2013. Allelochemicals in *Cuscuta campestris* Yuncker. In: Bakar, B.H., Kurniadie, D. and Tjitrosoedirdjo, S. (eds) The role of weed science in supporting food security by 2020. Proceedings of the 24th Asian-Pacific Weed Science Society Conference, Bandung, Indonesia, October 22-25, 2013: 417-423. [Sitosterol1, pinoresinol2, arbutin3, kaempferol4, quercetin5, and astragalin6 identified in *C. campestris.* All showed allelopathic effects at 500 mg/l, while some showed stimulatory effects at lower concentrations.]

*Bao YanJu, Kong XiangYing, Yang LiPing, Liu Rui, Shi Zhan, Li WeiDong, Hua BaoJin and Hou Wei. 2014. Complementary and alternative medicine for cancer pain: an overview of systematic reviews. Evidence-based Complementary and Alternative Medicine 2014: Article ID 170396. (http://www.hindawi.com/journals/ecam/2014/170396/) [A survey of literature suggesting that evidence for the value of *Viscum album* in pain relief in cancer was low or moderate.]

Barrett, C.F., Freudenstein, J.V., Li, J., Mayfield-Jones, D.R., Perez, L., Pires, J.C. and Santos, C. 2014. Investigating the path of plastid genome degradation in an early-transitional clade of heterotrophic orchids, and implications for heterotrophic angiosperms. Molecular Biology and Evolution 31(12): 3095-3112. [Studies on *Corallorhiza* may be of relevance to parasitic angiosperms.]

*Baumgartner, S., Flückiger, H., Kunz, M., Scherr, C. and Urech, K. 2014. Evaluation of preclinical assays to investigate an anthroposophic pharmaceutical process applied to mistletoe (*Viscum album* L.) extracts. Evidence-based Complementary and Alternative Medicine 2014: Article ID 620974. (http://www.hindawi.com/journals/ecam/2014/620974/) [An anthroposophically processed *V. album* extract,

produced by mixing winter and summer extracts in the edge of a high-speed rotating disk showed at least as good toxicity against cancer cells as a manually mixed extract.]

Bayram, Y. and Çıkman, E. 2014. (An investigation of broomrape species (*Orobanche* spp.) in lentil and tomato fields, and infestation and density of *Pytomyza orobanchia* Kaltenbach, 1864 (Diptera: Agromyzidae) on broomrape species, in Diyarbakır Province.) (in Turkish) Türkiye Biyolojik Mücadele Dergisi 5(2): 121-135. [In lentil fields, the density of *O. crenata* and *O. aegyptiaca* was 1-18/$m^2$, while in tomato, the density of broomrape *(O. ramosa* and *O. aegyptiaca*) was 1-10/$m^2$, All lentil and tomato fields were infested with *Orobanche* spp. and all the *Orobanche* was infested with *P. orobanchia*. Its possible use in integrated control is discussed.]

*Behbahani, M. 2014. Evaluation of *in vitro* anticancer activity of *Ocimum basilicum*, *Alhagi maurorum*, *Calendula officinalis* and their parasite *Cuscuta campestris*. PLoS ONE 9(12) e116049. (http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0116049) [*C. campestris* parasitising *O. basilicum*, *A. maurorum*, *C. officinalis* apparently acquired lutein, lupeol and eugenol, respectively from its host. The epoxide forms of these compounds are potential drug candidates for inducing apoptosis in human breast cancer cells.]

Bentley, J. and van Mele, P. 2015. Videos inspire farmers to experiment. Farming Matters 31(1): 38-39. [Describing the use of videos prepared by AccessAgriculture to help farmers understand that soil fertility is a key to controlling *Striga* (especially by using compost) and are encouraging farmers to start experimenting. See http://www.accessagriculture.org/node/1748/en for the composting video).]

Binu, N.K., Ashokan, P.K. and Balasundaran, M. 2015. Influence of different arbuscular mycorrhizal fungi and shade on growth of sandal (*Santalum album*) seedlings. Journal of Tropical Forest Science 27(2): 158-165. [*Glomus mosseae* was shown to be the most effective of 3 *Glomus* spp. tested and some useful data obtained on interactions with shade.]

Birhanie, Z.M. 2015. Participatory varietal selection of maize (*Zea mays* L.) in Pawe and Guangua districts, North Western Ethiopia. African Journal of Plant Science 9(4): 223-227. [*Striga*-resistance included among criteria on which farmers based their selection of breeding material.]

**Bozkurt, M.L., Muth, P., Parzies, H.K. and Haussmann, B.I.G. 2015. Genetic diversity of East and West African *Striga hermonthica* populations and virulence effects on a contrasting set of sorghum cultivars. Weed Research (Oxford) 55(1): 71-81. [This study involving samples of *S. hermonthica* from 5 sites in East and West Africa, and 16 sorghum cultivars demonstrated some tendency for *Striga* samples from East Africa to be more virulent than those from West Africa, but only 8% of genetic variation was attributable to the region of origin and 91% occurred within populations, emphasising the potential for natural selection and hence adaptation to resistant varieties locally, and the need to supplement the use of resistant varieties with other integrated techniques.]**

Candia, A.B., Medel, R. and Fontúrbel, F.E. 2014. Indirect positive effects of a parasitic plant on host pollination and seed dispersal. Oikos 123(11): 1371-1376. [Confirming that infestation of *Rhaphithamnus spinosus* by *Tristerix corymbosus* results in increased seed rain and seedling establishment due to seed dispersal processes rather than pollination effects.]

Cardoso, L.J.T., Mauad, L.P., Braga, J.M.A. 2015. *Lophophytum weddellii* Hook. f. (Balanophoraceae): first records for the Brazilian flora. Check List 11:1678. [This species, known previously only from Colombia and Peru, is reported from the Serra do Divisor National Park near the border with Peru.]

Carraz, M., Lavergne, C., Jullian, V., Wright, M., Gairin, J.E., Gonzales de la Cruz, M. and Bourdy, G. 2015. Antiproliferative activity and phenotypic modification induced by selected Peruvian medicinal plants on human hepatocellular carcinoma Hep3B cells. Journal of Ethnopharmacology 166: 185-199. [*Krameria lappacea* among species used traditionally for liver and digestive disorders and shown to have significant antiproliferative activity against Hep3B cells. This was associated with a lack of toxicity on primary human hepatocytes *in vitro*.]

Castle, L.M., Leopold, S., Craft, R. and Kindscher, K. 2014. Ranking tool created for medicinal plants at risk of being overharvested in the wild. Ethnobiology Letters, 2014, 5, 77-88. [*Santalum* spp. among those compared for their vulnerability to overharvesting in the wild.]

Chapman, T.F. 2015. Reintroduced burrowing bettongs (*Bettongia lesueur*) scatter hoard sandalwood (*Santalum spicatum*) seed. Australian Journal of Zoology 63(1): 76-79. [The marsupial rat, *B. lesueur* is shown to have a valuable potential role in spreading seed of *S. spicatum* to new sites.]

Chkhubianishvili, T., Kakhadze, M., Malania, I., Chubinishvili, M., Skhirtladze, R. and Rizhamadze, I. 2015. Basis for developing biotechnology for plant protection means in Georgia. International Journal of Agricultural Technology 11(2): 275-286. [*O. cumana* is the major pest of sunflower crops in Georgia. *Fusarium oxysporum* var. *orthoceras* from Israel has shown excellent results in preliminary studies.]

Cimmino, A., Fernández-Aparicio, M., Andolfi, A., Basso, S., Rubiales, D. and Evidente, A. 2014. Effect of fungal and plant metabolites on broomrapes (*Orobanche* and *Phelipanche* spp.) seed germination and radicle growth. Journal of Agricultural and Food Chemistry 62(43):10485-10492. [Among the metabolites tested, *epi*-sphaeropsidone, cyclopaldic acid, and those belonging to the sesquiterpene class induced broomrape germination in a species-specific manner. *epi*-Epoformin, sphaeropsidin A, and cytochalasans

inhibited germination of GR24-treated broomrape seeds.]

Clayson, C., García-Ruiz, I. and Costea, M. 2014. Diversity, evolution, and function of stomata bearing structures in *Cuscuta* (dodders, Convolvulaceae): from extrafloral nectar secretion to transpiration in arid conditions. Perspectives in Plant Ecology, Evolution and Systematics 16(6): 310-321. [Describing the occurrence of secretory extrafloral nectaries (in *Monogynella* species only) and stomatiferous protuberances, which are non-secretory (ubiquitous on the flowers of *Cuscuta* and *Pachystigma*, but absent on their stems, while occurring on haustorial stems of *Grammica* spp. – not on vegetative stems). Observations on water uptake and transpiration suggest that the latter have evolved to stimulate host water uptake under dry conditions.].

Corbet, S.A. and Huang ShuangQuan. 2014. Buzz pollination in eight bumblebee-pollinated *Pedicularis* species: does it involve vibration-induced triboelectric charging of pollen grains? Annals of Botany 114(8): 1665-1674. [Explosive pollen release in *Pedicularis* is stimulated by the precise frequency of buzzing by *Bombus frisianus* bees. Different species of *Pedicularis* require worker bees of particular size, and the frequency of buzzing may have to vary according to size and pollen load of the flowers, apparently resulting in triboelectric (static) charging.]

Costa, R.M.P.B., Vaz, A.F.M., Xavier, H.S., Correia, M.T.S. and Carneiro-Da-Cunha, M.G. 2015. Phytochemical screening of *Phthirusa pyrifolia* leaf extracts: free-radical scavenging activities and environmental toxicity. South African Journal of Botany 99: 132-137. [The water extract from dried leaves of *P. pyrifolia* showed greater anti-oxidant activity than butanol, ethyl ether or ethyl acetate extracts. It also exhibited low toxicity against *Poecilia* sp. fish, *Artemia salina* brine shrimp and *Aedes aegypti* larvae In Brazil.]

Costea, M., García, M.A. and Stefanovic´, S. 2015. A phylogenetically based infrageneric classification of the parasitic plant genus *Cuscuta* (Dodders, Convolvulaceae). Systematic Botany 40(1): 269-285. [A new phylogenetic classification is proposed that places all 194 currently accepted *Cuscuta* species into four subgenera and 18 sections. An identification key, an overview of morphology, geographical distributions, taxonomic notes, and lists of included species are also provided.]

Da Silva, M.P., de Barros, R.F.M. and Moita Neto, J.M. 2015. (Natural pharmacopeia of rural communities in the State of Piauí, Northeast of Brazil.) (in Portuguese) Desenvolvimento e Meio Ambiente 33: 193-207. [*Ximenia americana* among the 'most versatile' of the remedies surveyed.]

Dakskobler, I. 2015. (New localities and phytosociological characteristics of sites of selected rare phanerogams in Slovenia and north-eastern Italy. Hladnikia 35: 3-25. [Recording new localities in Slovenia for *Orobanche elatior*, *O. alsatica* ssp. *alsatica* and *Pedicularis hoermanniana*.]

Daneshvar, A., Tigabu, M., Karimidoost, A., Farhadi, M. and Odén, P.C. 2014. Growth characteristics and reproductive output of dwarf mistletoe-infected *Juniperus polycarpos* in Iran. Journal of Forestry Research 25(4): 827-834. [Moderate infection of *J. polycarpos* by *Arceuthobium oxycedri* did not seriously reduce tree growth but did impair seed production and germination, perhaps contributing to poor natural regeneration.]

Danton, P. 2014. A contribution to the flora of Juan Fernández archipelago (Chile). (Description of 4 new taxa: Angiospermae - *Erigeron corrales-molinensis* sp. nov. (Asteraceae), *Euphrasia formosissima* Skottsb. subsp. *cucharensis* subsp. nov. (Orobanchaceae), *Haloragis masatierrana* var. *applanata* var. nov. et var. *scabrida* var. nov. (Haloragidaceae).) (in French) Acta Botanica Gallica 161(4): 355-371.

**Das, M., Fernández-Aparicio, M., Yang, Z.Z., Huang, K., Wickett, N.J., Alford, S., Wafula, E.K., Depamphilis, C., Bouwmeester, H., Timko, M.P., Yoder, J.I. and Westwood, J.H. 2015. Parasitic plants *Striga* and *Phelipanche* dependent upon exogenous strigolactones for germination have retained genes for strigolactone biosynthesis. American Journal of Plant Sciences 6(8): 1151-1166. [Results indicate that *S. hermonthica* and *P. aegyptiaca* have retained functional genes involved in strigolactone biosynthesis, suggesting that the parasites use both endogenous and exogenous strigolactones and have mechanisms to differentiate between the two.]**

Dash, R., Mishra, M.M. and Ranasingh, N. 2015. Management of *Cuscuta* in niger under south eastern hilly regions of Odisha. Environment and Ecology 33(1B): 605-606. [Reporting partial control of *Cuscuta* (presumably *C. campestris*) and 10% yield increase in niger seed with pre-emergence treatments of pendimethalin and imazethapyr, but best treatments involved a stale seedbed which may have contributed – there was no stale seed-bed control.)

De Cuyper, C., Fromentin, J., Yocgo, R.E., de Keyser, A., Guillotin, B., Kunert, K., Boyer, F.D. and Goormachtig, S. 2015. From lateral root density to nodule number, the strigolactone analogue GR24 shapes the root architecture of *Medicago truncatula*. Journal of Experimental Botany 66(1): 137-146. [Showing that strigolactone reduces the lateral root density in *M. trunculata* and affects nodulation by *Sinorhizobium meliloti*, increasing nodule number at 0.1 µM GR24 but strongly reducing it at 2 and 5 µM.]

Delprete, P.G. 2014. *Ombrophytum guayanensis*, the first record of subfamily Lophophytoideae (Balanophoraceae) in the Guayana Shield. Phytotaxa 175:263-269. [A recent collection from French Guiana was identified as a species of *Ombrophytum* unknown to science (*O. guayanensis*), which is here described and illustrated.]

Demey, A., de Frenne, P., Baeten, L., Verstraeten, G., Hermy, M., Boeckx, P. and Verheyen, K. 2015. The

effects of hemiparasitic plant removal on community structure and seedling establishment in semi-natural grasslands. Journal of Vegetation Science 26(3): 409-420. [Removal of *Rhinanthus angustifolius* significantly affected the abundance of species relative to control plots, both positively and negatively, and decreased the species evenness while removal of *Pedicularis sylvatica* only increased the abundance of some species. Juncaceae were increased by removal of either. It is proposed as a new hypothesis that species with persistent clonal spread are more vulnerable to parasitism.]

Denchev, T.T., Denchev, C.M. and Shivas, R.G. 2013. Two new *Entyloma* species (*Entylomatales*, *Ustilaginomycotina*) from the USA. Mycobiota 3: 35-39. [*E. castillejae* described from unspecified *Castilleja* sp., collected in Colorado in 1931.]

Deng LeJun, Zhou WeiPing, Liu ShaoFeng, Cai Cong, Gao XiaoXia and Chen XiaoYing. 2014. (Phylogenetic analysis of *Santalum album* in Zhanjiang based on rDNA ITS sequence.) (in Chinese) Journal of Guangdong Pharmaceutical University 30(3): 314-318. [A new phylogenetic classification is proposed that places all 194 currently accepted *Cuscuta* species into four subgenera and 18 sections. An identification key, an overview of morphology, geographical distributions, taxonomic notes, and lists of included species are also provided.]

Di Virgilio, A., Amico, G.C. and Morales, J.M. 2014. Behavioral traits of the arboreal marsupial *Dromiciops gliroides* during *Tristerix corymbosus* fruiting season. Journal of Mammalogy 95(6): 1189-1198. [Using videos recorded by camera traps to record the activity of *D. gliroides* feeding on *T. corymbosus* in Argentina and finding that it is mainly active on darker nights, avoiding moonlight.]

Dinesh Aryal and Nadeem Khan. 2015. Anxiolytic and motor coordination activity of ethanolic and aqueous extracts of *Dendrophthoe falcata* leaves in mice. International Journal of Pharmaceutical Sciences and Research (IJPSR) 6(4): 1753-1760. [Concluding that the ethanolic extract from leaves of *D. falcata* has anxiolytic activity, perhaps by acting as the benzodiazepine recognition site of the GABA-benzodiazepine receptor complex.]

Dobrecky, C.B., Moreno, E., Garcés, M., Lucangioli, S., Ricco, R., Evelson, P. and Wagner, M.L. 2014. (Polyphenol composition in *Ligaria cuneifolia* (Loranthaceae) and its relationship with the antioxidant capacity.) (in Spanish) Dominguezia 30(2): 35-39. [*L cuneifolia* is used as a hypotensive agent in Argentina. Analysis of a range of components confirms the presence of flavonoids and hydroxycinnamic acids which could account for its antioxidant activity.]

Dong LiNa, Wang Hong, Wortley, A.H., Li DeZhu and Lu Lu. 2015. Fruit and seed morphology in some representative genera of tribe Rhinantheae *sensu lato* (Orobanchaceae) and related taxa. Plant Systematics and Evolution 301(1): 479-500. [Describing the fruit and seed morphology in 48 taxa of 22 genera in the tribe Rhinantheae s.l. and related genera of Orobanchaceae. Distinguishing five major types seed ornamentation viz. reticulate, cristate-winged, sulcate, psilate and irregularly striate. Providing a key based only on fruit and seed characters.]

Donnapee, S., Li Jin, Yang Xi, Ge AiHua, Donkor, P.O., Gao XiuMei and Chang YanXu. 2014. *Cuscuta chinensis* Lam.: a systematic review on ethnopharmacology, phytochemistry and pharmacology of an important traditional herbal medicine. Journal of Ethnopharmacology 157: 292-308. [*C. chinensis* has found use as a traditional medicine in China, Korea, Pakistan, Vietnam, India and Thailand, commonly as an anti-aging agent, anti-inflammatory agent, pain reliever and aphrodisiac. Phytochemicals isolated include at least 18 flavonoids; 13 phenolic acids; 2 steroids; 1 hydroquinone; 10 volatile oils; 22 lignans; 9 polysaccharides; 2 resin glycosides; 16 fatty acids. These phytochemicals and plant extracts exhibit a range of pharmacological activities that include hepatoprotective, renoprotective, antiosteoporotic, antioxidant, anti-aging, antimutagenic, antidepressant, improve sexual function, abortifacient effects, etc.]

Dumont, E.S., Gnahoua, G.M., Ohouo, L., Sinclair, F.L., Vaast, P., Vaast, P. and Somarriba, E. 2014. Farmers in Côte d'Ivoire value integrating tree diversity in cocoa for the provision of ecosystem services. Agroforestry Systems 88(6): 1047-1066. [Incidentally mentioning the lack of control measures for (unspecified) mistletoes.]

El-Mokni, R., Domina, G., Sebei, H.and El-Aouni, M.H. 2015. Taxonomic notes and distribution of taxa of *Orobanche* gr. *minor* (Orobanchaceae) from Tunisia. Acta Botanica Gallica 162(1): 5-10. [Covering *O. amethystea*, *O. canescens*, *O. hederae*, *O. litorea*, *O. minor* and *O. pubescens*. *O. litorea* is new to North Africa, and *O. canescens* has been confirmed for North Africa more than 100 years after the only known collection. *O. hederae* and *O. pubescens* are new to Tunisia.]

Encheva, J., Köhler, H., Christov, M., Shindrova, P., Encheva, V. and Friedt, W. 2014. New sunflower (*H. annuus* L.) lines as results of interspecific and intergeneric hybridization and application of method of direct organogenesis in F1 immature embryo. Bulgarian Journal of Agricultural Science 20(6): 1444-1449. [The method was used to create the interspecific crosses *H. annuus* (cv. Albena) × *H. tuberosus*, *H. annuus* (cv. Albena) × *H. salicifolius* and intergeneric cross *H. annuus* (cv. Albena) × *Verbisina helianthoides*. Selfing and selection yielded a diversity of new sunflower lines, some of which showed resistance to *Orobanche cumana*.]

Erasmus, L.J.C., Potgieter, M.J. and Semenya, S.S. 2015. Erectile dysfunction: definition and materia medica of Bapedi traditional healers in Limpopo province, South Africa. Journal of Medicinal Plants Research 9(3): 71-77. [A survey confirmed that *Osyris lanceolata* is

among plants used as aphrodisiacs – but no proof of effectiveness provided.]

Eshetu, G.R., Dejene, T.A., Telila, L.B. and Bekele, D.F. 2015. Ethnoveterinary medicinal plants: preparation and application methods by traditional healers in selected districts of southern Ethiopia. Veterinary World 8(5): 674-684. [Including reference to the use of the root of *Osyris quadripartita* for the treatment of mastitis in livestock.]

*Estko, M., Baumgartner, S., Urech, K., Kunz, M., Regueiro, U., Heusser, P. and Weissenstein, U. 2015. Tumour cell derived effects on monocyte/macrophage polarization and function and modulatory potential of *Viscum album* lipophilic extract in vitro. BMC Complementary and Alternative Medicine 15(130). (http://www.biomedcentral.com/1472-6882/15/130)

Evju, M., Stabbetorp, O.E. and Bratli, H. 2014. Salt meadows in Østfold - area, ecological condition and red listed species. Blyttia 72(4): 235-248. [*Odontites vernus* among species referred to.]

Ezeaku, I.E., Angarawai, I.I., Aladele, S.E. and Mohammed, S.G. 2015. Correlation, path coefficient analysis and heritability of grain yield components in pearl millet (*Pennisetum glaucum* (L.) R. Br.) parental lines. Journal of Plant Breeding and Crop Science 7(2): 55-60. [A study of 24 parental lines of pearl millet A/B pairs showed high to moderate broad-sense heritability; with panicle length expressing the highest heritability (78.95%), followed by grain yield (75.43%) and head weight (73.30%). Response to *Striga hermonthica* among the characters studied.]

Fan RongHua, Ding Wei, Ma YuYing, Lin HongLi, Men Lei, Duan MengMeng, Zhao YunLi and Yu ZhiGuo. 2015. Development of a sensitive ultra high performance liquid chromatography with tandem mass spectrometry method for the simultaneous quantification of nine active compounds in rat plasma and its application to a pharmacokinetic study after administration of *Viscum coloratum* extracts. Journal of Separation Science 38(3): 530-540.

Fawzy, G.A., Al-Taweel, A.M. and Perveen, S. 2014. Anticancer activity of flavane gallates isolated from *Plicosepalus curviflorus*. Pharmacognosy Magazine 10(39 (Suppl.)): 519-523. [The stems of *P. curviflorus* are used traditionally for the treatment of cancer in Yemen. Tests on human cancer cell lines MCF-7, HepG-2, HCT-116, Hep-2 and HeLa confirm potential for quercetin and one of the flavane gallates isolated from *P. curviflorus*.]

Fujiwara, Y. and Ito, M. 2015. Synergistic effect of fragrant herbs in Japanese scent sachets. Planta Medica 81(3): 193-199. [Oil of *Santalum album* showing sedative effects, enhanced in mixture with 7 others.]

Furuhashi, T., Kojima, M., Sakakibara, H., Fukushima, A., Hirai, M.Y. and Furuhashi, K. 2014. Morphological and plant hormonal changes during parasitization by *Cuscuta japonica* on *Momordica charantia*. Journal of Plant Interactions 9(1): 220-232. [Parasitized *M. charantia* stems showed reduced photosynthetic activity while histological observation revealed an increased number of vascular bundles especially near the *C. japonica* haustoria. The defensive response of the host mainly involved the salicylic acid pathway. Drastic increase of cytokinins in host stems would play an important role for hypertrophy.]

Ganesan, S., Saraswathy, K. and Latha, R. 2014. Floristic diversity and its conservation status in the selected sacred groves of Madurai district, Tamil Nadu, India. Indian Journal of Tropical Biodiversity 22(1): 16-27. [150 species recorded including *Dendrophthoe falcata*.]

Gathara, M., Makenzi, P., Kimondo, J. and Muturi, G. 2014. Prediction of *Osyris lanceolata* (Hochst. & Steud.) site suitability using indicator plant species and edaphic factors in humid highland and dry lowland forests in Kenya. Journal of Horticulture and Forestry 6(11): 99-106. [Known as African sandalwood, *O. lanceolata* has potential for commercial production in Africa. This survey established a consistent association with *Rhus natalensis* in highland forest. Hence the latter could be used as an indicator of suitable sites for plantations.]

Ghorbani, A. and Hosseini, A. 2015. Cancer therapy with phytochemicals: evidence from clinical studies. Avicenna Journal of Phytomedicine (AJP) 5(2): 84-97. [A literature review confirming that *Viscum album* has satisfactory instances of clinical evidence for supporting its anticancer effects.]

Gibot-Leclerc, S., Reibel, C., le Corre, V. and Dessaint, F. 2015. Unexpected fast development of branched broomrape on slow-growing Brassicaceae. Agronomy for Sustainable Development 35(1): 151-156. [Pot experiments showed that *Phelipanche ramosa* developed faster on the relatively slow-growing *Capsella bursa-pastoris*, *C. rubella*, *Cardamine hirsuta*, *Lepidium campestre*, *L. draba* and *Sinapis arvensis* than on the fast-growing *Arabidopsis thaliana*.]

Ginman, E., Prider, J., Matthews, J., Virtue, J. and Watling, J. 2015. Sheep as vectors for branched broomrape (*Orobanche ramosa* subsp. *mutelii* [F.W. Schultz] Cout.) seed dispersal. Weed Biology and Management 15(2): 61-69. [Confirming that 7 days is a suitable quarantine period to allow loss of seed from attachment to the fleece or loss of viability following ingestion.]

Girija, T., Vijaya, V.C. and Abraham, C.T., 2013. Comparison of competitiveness of tree parasites, *Dendrophthoe falcata*, *Helicanthus elastica* and *Macrosolen capitellatum* by oxygen isotope discrimination and nutrient analysis. In: Bakar, B.H., Kurniadie, D. and Tjitrosoedirdjo, S. (eds) The role of weed science in supporting food security by 2020. Proceedings of the 24th Asian-Pacific Weed Science Society Conference, Bandung, Indonesia, October 22-25, 2013: 253-257. [Studies on *D. falcata*, *H. elastica* and *M. capitellatum* in India indicate higher transpiration rates and accumulation of K, Ca and N in *D. falcata* than in the other 2 species, suggesting it may have a more damaging effect on its hosts.]

*González, C., Harvey, N. and Ornelas, J.F. 2015. Development and characterization of microsatellite loci in the mistletoe *Psittacanthus schiedeanus* (Loranthaceae). Applications in Plant Sciences 3(1): 1400099. (http://www.bioone.org/doi/full/10.3732/apps.1400099) [120 alleles were recorded across 39 individuals from four populations *P. schiedeanus*, a common mistletoe species on cloud forest-adapted tree hosts in Mexico. Loci described will be useful in studies of genetic diversity and genetic population differentiation in natural populations and will provide valuable information regarding host distribution.]

Guchetl, S.Z., Antonova, T.S. and Tchelustnikova, T.A. 2014. Genetic similarity and differences between the *Orobanche cumana* Wallr. populations from Russia, Kazakhstan, and Romania revealed using the markers of simple sequence repeat. Russian Agricultural Sciences 40(5): 326-330. [Nineteen samples of *O. cumana* from Russia and Kazakhstan clustered in one gene pool while a second cluster consisted of 5 populations from Romania, all regardless of racial composition.]

*Gulati, V., Gulati, P., Harding, I.H. and Palombo, E.A. 2015. Exploring the anti-diabetic potential of Australian Aboriginal and Indian Ayurvedic plant extracts using cell-based assays. BMC Complementary and Alternative Medicine 15: 8pp. (http://www.biomedcentral.com/1472-6882/15/8 ) [*Santalum spicatum* and *S. lanceolatum* among plants showing anti-diabetic activity.]

Gwatidzo, C., Masamba, W.R.L., Mubyana-John, T., Oldeland, J., Erb, C., Finckh, M. and Jürgens, N. 2013. Variations in soil physicochemical characteristics in some soil profiles of Okavango Delta's Pan-handle region, Botswana. Biodiversity and Ecology 5: 303-310. [Including the observation that Ca was relatively high in soils under *Ximenia americana*.]

Halidu, J., Abubakar, L., Izge, U.A., Ado, S.G., Yakubu, H. and Haliru, B.S. 2015. Correlation analysis for maize grain yield, other agronomic parameters and *Striga* affected traits under *Striga* infested/free environment. Journal of Plant Breeding and Crop Science 7(1): 9-17. [Relating to studies with *S. hermonthica* in Nigeria.]

Hargreaves, A.L., Weiner, J.L. and Eckert, C.G. 2015. High-elevation range limit of an annual herb is neither caused nor reinforced by declining pollinator service. Journal of Ecology (Oxford) 103(3): 572-584. [Finding no evidence for pollination failure towards the upper range limit of *Rhinanthus minor*. Moreover, unlike some species with a capacity for autogamy, autonomous selfing makes a major contribution to *R. minor*'s mating system and demography, and likely buffers reproductive success from stochasticity in pollination.]

Hassan, M.M., Osman, A.G., Rugheim, A.M.E., Ali, A.I., Abdelgani, M.E. and Babiker, A.G.T. 2015. Effects of bacterial isolates and strains on *Phelipanche ramosa* (L.) Pomel haustorium initiation. International Journal of Biosciences (IJB) 6(2): 296-303. [Fifteen bacteria including 9 organic nitrogen users 6 mineral nitrogen users) and 3 bacterial strains (*Bacillus circulans*, *B. megatherium* var. *phosphaticum* and *Azospirillum brasiliense* all caused significant reduction in haustoria, the most active being *Serratia odorifera* and *Rhizobium radiobacter*, reducing haustorial initiation by 45%.]

Havyarimana, F., Bogaert, J., Ndayishimiye, J., Barima, S.S.Y., Bigendako, M.J., Lejoly, J. and de Cannière, C. 2013. (Impact of the spatial structure of *Strombosia scheffleri* Engl. and *Xymalos monospora* (Harv.) Baill. on natural regeneration and coexistence of tree species in the Bururi Forest Nature Reserve in Burundi.) (in French) Bois et Forêts des Tropiques 316: 49-61. [Including observations on *Strombosia scheffleri* (Olacaceae)]

He MengYin and Fan FuYuan. 2015. (Adjunctive treatment of axial undifferentiated spondyloarthritis by Qiangji Recipe: a clinical study.) (in Chinese) Chinese Journal of Integrated Traditional and Western Medicine 35(1): 37-40. [*Taxillus chinensis* is just one of the components of Chinese herbal remedy 'QR' – the others being '*Herba Epimedii*, antler glue, *Cibotium Barometz*, eucommia bark, dipsacus asper, two toothed achyranthes root, drynaria, ground beetle, scorpion, wild celery, notopterygium incisium, cow-fat seed, white mustard seed, and licorice root'. (NB. No eye of newt or toe of frog). The concoction showed useful results in adjunctive treatment of axial undifferentiated spondyloarthritis.]

Hejcmanová, P., Hejcman, M., Stejskalová, M. and Pavlů, V. 2014. (Livestock winter feeding in prehistory: role of browse leaves, annual twigs of woody plants, senescent grasses, *Hedera helix* and *Viscum album*.) (in French) In: Baumont, R. *et al.* (eds) Options Méditerranéennes. Série A, Séminaires Méditerranéens 109: 79-82. [Concluding that *V. album* foliage has high nutritive value and was probably utilised for livestock feed in prehistory.]

Hobbhahn, N. and Johnson, S.D. 2015. Sunbird pollination of the dioecious root parasite *Cytinus sanguineus* (Cytinaceae). South African Journal of Botany 99: 138-143. [Confirming that, unexpectedly, the flowers of *C. sanguineus*, which are close to the ground under other vegetation are pollinated by sunbirds, as the floral structure and colour would suggest. Other species of *Cytinus* are pollinated by rodents or by ants. In South Africa.]

Houngbedji, T., Pocanam, Y., Shykoff, J., Nicolardot, B. and Gibot-Leclerc, S. 2014. (A new major parasitic plant in rice in Togo: *Rhamphicarpa fistulosa*.) (in French) Cahiers Agricultures 23(6): 357-365. [*R. fistulosa* was found in 80% of the 33 lowlands visited in Togo causing serious yield loss. Farmers use hand weeding and apply chemical fertilizers but always at sub-optimal rates. Heavy infestation levels lead to the abandonment of plots.]

Hruševar, D., Mitic´, B., Sandev, D. and Alegro, A. 2014. New records of vascular plants on the Mt Medvednica. Natura Croatica 23(2): 275-286. [Including *Orobanche gracilis*.]

Huish, R.D., Manow, M. and McMullen, C.K. 2015. Floral phenology and sex ratio of piratebush (*Buckleya distichophylla*), a rare dioecious shrub endemic to the Southern Appalachian Mountains. Castanea 80(1): 1-7. [Results on *B. distichophylla* (Santalaceae) show a male-biased sex ratio (61:39) of flowering individuals, with 15% nonflowering.]

Ibrahim, A., Ahom, R.I., Magani, I.E. and Musa, M.I. 2014. Spatial distribution and density of *Striga hermonthica* (Del.) Benth infestation associated with cereal production in Southern Guinea Savanna farming systems. Journal of Biodiversity and Environmental Sciences (JBES) 5(4): 419-427. [In Benue and Nasarawa states in southern Nigeria, 67% of the surveyed area was infested with a high density of *S. hermonthica*, mainly in sorghum, less in pearl millet. 40% of the farmers reported that new *Striga* control coping strategies, are received from extension agents, during Monthly Technology Review Meetings.]

Ifie, B.E., Badu-Apraku, B., Gracen, V. and Danquah, E.Y. 2015. Genetic analysis of grain yield of IITA and CIMMYT early-maturing maize inbreds under *Striga*-infested and low-soil-nitrogen environments. Crop Science 55(2): 610-623. [Identifying lines with combined resistance or tolerance to *S. hermonthica* as well as low-N. Hybrids ENT 11 × TZEI 4 and TZEI 65 × ENT 11 were identified as the most stable and high-yielding.]

*Ikeue, D., Schudoma, C., Zhang WenNa, Ogata, Y., Sakamoto, T., Kurata, T., Furuhashi, T., Kragler, F. and Aoki, K. 2015. A bioinformatics approach to distinguish plant parasite and host transcriptomes in interface tissue by classifying RNA-Seq reads. Plant Methods 11(34) 16pp. (http://www.plantmethods.com/content/pdf/s13007-015-0066-6.pdf) [This paper described genomics studies of gene expression in *Cuscuta*. The host and the parasite form new cellular connections, suggesting coordination of developmental and biochemical processes. RNA-Seq reads were done from an interface region between *C. japonica* and host *Impatiens balsamina*. Sequencing reads were classified as either belonging to the host or to the parasite. Analysis of gene expression profiles at 5 parasitizing stages revealed differentially expressed genes from both parasitic plant and a host-model, and uncovered some of the coordination of cellular processes between the two plants. ]

Ito, S. 2014. Development of strigolactone function regulators. Journal of Pesticide Science 39(3/4): 170-171. [Describing a novel triazole derivative TIS108, with potent activity, reducing strigolactone levels *in planta* and inducing strigolactone biosynthetic mutant-like morphology in *Arabidopsis*.]

*Ito, S. and 12 others. 2015. Strigolactone regulates anthocyanin accumulation, acid phosphatases production and plant growth under low phosphate condition in Arabidopsis. PLoS ONE 10(3) e0119724. (http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0119724) [Showing that the typical phosphate starvation responses in *Arabidopsis* are partially dependent on the strigolactone signaling pathway, suggesting a potential overlap between strigolactone signaling and phosphate starvation signaling pathways in plants.]

Itta, C.Z., Magani, E.I. and Ahom, R.I. 2014. Effectiveness of Parkia (*Parkia biglobosa*) products for the control of *Striga genesrioides* in the Southern Guinea Savanah. Journal of Biodiversity and Environmental Sciences (JBES) 5(3): 36-51. [*Parkia* fruit powder reduced *S. gesnerioides* by about 50% but did not significantly increase yields of susceptible cowpea varieties which failed to match the performance of *Striga*-resistant varieties IT97K-499-35, IT98K-573-1-1, IT03K-338-1, IT98K-205-8 and UAM11D-24-55-3.]

Jamil, A.W.M. and Omar, M.K.M. 2015. Strength and stiffness of remnants of fractured timber. Journal of Tropical Forest Science 27(1): 115-126. [*Scorodocarpus borneensis* (Olacaceae) one of two hardwoods studied.]

Ji YanBin, Zhang FengDong, Sun XueLiang, Sun MengMeng, Wei JunLi, You HongZheng and Chen ChengXun. 2015. (Effect of *Siphonostegia* and *Eucommia ulmoides* on the growth and health indicators of *Eriocheir sinensis*.) (in Chinese) Journal of Economic Animal 19(1): 34-40. [*Siphonostegia* (unspecified) shown to improve the antioxidant capacity and immunity of the Chinese mitten crab.]

Jiang Ying, Wang Chi, Li YingYing, Wang XueCong, An JianDuo, Wang YunJiao and Wang XueJiang. 2014. Mistletoe alkaloid fractions alleviates carbon tetrachloride-induced liver fibrosis through inhibition of hepatic stellate cell activation via TGF-β/Smad interference. Journal of Ethnopharmacology 158(Part A): 230-238. [Results suggest that the alkaloid fraction from *Viscum coloratum* may have potential as a therapeutic agent for the treatment of hepatic fibrosis.]

Joshi, R.K., Joshi, B.C. and Sati, M.K. 2014. Chemical and chemotaxonomic aspects of some aromatic and medicinal plants species from Utrrakhand: a review. Asian Journal of Pharmacy and Technology 4(3): 157-162. [A review including reference to *Santalum* spp.]

Kabiri, S., Rodenburg, J., Kayeke, J., van Ast, A., Makokha, D.W., Msangi, S.H., Irakiza, R. and Bastiaans, L. 2015. Can the parasitic weeds *Striga asiatica* and *Rhamphicarpa fistulosa* co-occur in rain-fed rice? Weed Research (Oxford) 55(2): 145-154. [The two species overlap in a region of southern Tanzania, but careful survey over the area, backed up by lot experiments confirm that while *S. asiatica* is favoured by free draining soils where non-parasitic indicator species include *Pennisetum polystachion*,. *Rottboellia cochinchinensis* and *Mitracarpus hirtus*, *R. fistulosa* is favoured by waterlogged soils associated with *Ammania auriculata*, *Cyperus distans*, *Fimbristylis littoralis* and *Oryza longistaminata*. Hence different management strategies are required.]

***Kaiser, B., Vogg, G., Fürst, U.B. and Albert, M. 2015. Parasitic plants of the genus *Cuscuta* and their interaction with susceptible and resistant host plants.**

**Frontiers in Plant Science 6(February): 45 pp. (http://journal.frontiersin.org/article/10.3389/fpls.2015.00045/full) [A detailed review of the interactions of *Cuscuta* spp. with their hosts with particular reference to the resistance of tomato to *C. reflexa* when epidermal tomato cells elongate and die following a hypersensitive-type response, but noting that similar reactions occur when *C. pentagona* is involved, without preventing infection.]**

Kaitera, J., Hiltunen, R. and Hantula, J. 2015. *Cronartium* rust sporulation on hemiparasitic plants. Plant Pathology 64(3): 738-747. [Confirming sporulation of *C. flaccidum* on *Euphrasia*, *Castilleja*, *Pedicularis* and *Rhinanthus* spp.]

Kalinowski, P. 2014. (Rare vascular plants of the Podlasie Nadbużan´skie region (eastern Poland) - Part 3. Synanthropic plants.) (in Polish) Fragmenta Floristica et Geobotanica Polonica 21(2): 253-273. [A first 'reliable' report of *Thesium arvense* for Poland.]

**Kannan, C., Aditi, P. and Zwanenburg, B. 2015 Quenching the action of germination stimulants using borax and thiourea, a new method for controlling parasitic weeds: a proof of concept. Crop Protection 70: 92-98. [Providing encouraging results on the possibility of destroying strigolactones in the soil, using borax and/or thiourea (see previous paper noted in Haustorium 65). Exposure of tomato roots to 5 mM concentrations of either compound caused no toxicity, while solutions of 1 mM of either prevented germination of *Orobanche crenata* adjacent to the tomato roots. Note that the abstract refers to 'phototoxic' rather than 'phytotoxic' effects, and the authors have asked to point out that in the structure of Nijmegen-1: the carbonyl in the ring next to the aromatic ring is missing.]**

Kannan, C., Kumar, B., Aditi, P. and Gharde, Y. 2014. Effect of native *Trichoderma viride* and *Pseudomonas fluorescens* on the development of *Cuscuta campestris* on chickpea, *Cicer arietinum*. Journal of Applied and Natural Science 6(2): 844-851. [*C. campestris* is a serious parasite of chickpea in India, reducing yields by up to 85%. *Trichoderma viride*. and *Pseudomonas fluorescens* used as seed treatments and foliar sprays increased production of defense enzymes in chickpea and thus delayed the development and flowering of *C. campestris.*]

**Kaya, Y. 2014. Sunflower production in Balkan region: current situation and future prospects. Agriculture and Forestry 60(4): 95-101. [A comprehensive review of sunflower production in the Balkans and Turkey. Sunflower production is increasing in the region due to higher demand for oil crops. Turkey is the main importer in the region while other countries such as Romania, Bulgaria, Moldova and Serbia are among the main exporters in the world. Including discussion of *Orobanche cumana* and its control and noting that genetically herbicide resistant varieties and post-emergence application of imidazolinone herbicides controlling both *O. cumana* and the main broad leaved weeds, is increasing.]**

Khadda, B.S., Kanak Lata, Raj Kumar, Jadav, J.K. and Rai, A.K. 2015. Performance of lucerne (*Medicago sativa*) under semi-arid ecosystem of Central Gujarat. Indian Journal of Agricultural Sciences 85(2): 199-202. [*Cuscuta* (presumably *C. campestris*) among factors reducing lucerne productivity in the region.]

Kidane, B., van der Maesen, L.J.G., van Andel, T., Asfaw, Z. and Sosef, M.S.M. 2014. Ethnobotany of wild and semi-wild edible fruit species used by Maale and Ari ethnic communities in southern Ethiopia.,Ethnobotany Research and Applications 12: 455-471. [*Ximenia caffra* among the most-traded fruits in this region.]

*Kim KiWook, Yang SeungHoon and Kim JongBae. 2014. Protein fractions from Korean mistletoe (*Viscum album coloratum*) extract induce insulin secretion from pancreatic beta cells. Evidence-based Complementary and Alternative Medicine 2014: Article ID 703624. (http://www.hindawi.com/journals/ecam/2014/703624/) [Results suggest that *V. coloratum* could have use as a medicinal reagent to reduce blood glucose level in type I diabetic patients.]

Kim SoKho, Lee DongHo, Kim JaeKyung, Kim JaeHun, Park JongHeum, Lee JuWoon and Kwon JungKee. 2014. Viscothionin isolated from Korean mistletoe improves nonalcoholic fatty liver disease via the activation of adenosine monophosphate-activated protein kinase. Journal of Agricultural and Food Chemistry 62(49): 11876-11883. [Viscothionin, isolated from *Viscum coloratum* was shown to have potential for nonalcoholic fatty liver disease (NAFLD).]

Kim YoungJik. 2014. (Effects of dietary supplementation of red ginseng mare and Korean mistletoe powder on performance and meat quality of broiler chicken.) (in Korean) Korean Journal of Poultry Science 41(3): 197-204. [Addition of 0.5% powder based on *Viscum coloratum* did not affect meat production in chickens but revealed minor improvements in lipid oxidative stability.]

Kim, Y.J. and Choi, I.H.. 2014. Comparison of the effects of supplemental Korean mistletoe (*Viscum album* var. *coloratum*) powder and antibiotic on growth performance, serum cholesterol profiles, and meat quality of broilers. Acta Agriculturæ Scandinavica. Section A, Animal Science 64(3): 154-160. [Addition of *V. album* var. *coloratum* (= *V. coloratum*) at 1-2% of poultry diet had a beneficial influence via improved antioxidant effects.]

Koffi, A.A., Kouassi, F.A., N'Goran, S.B.K. and Soro, D. 2014. (The Loranthaceae, parasites of trees and shrubs: the case of Katiola Department, in the north of Côte d'Ivoire.) (in French) International Journal of Biological and Chemical Sciences 8(6): 2552-2559. [A survey detected just 2 species of Loranthaceae - *Agelanthus dodoneifolius* and *Tapinanthus bangwensis*. These occurred in 3-6% of wild trees but were not recorded in crop species.]

*Konaté, K., Yomalan, K., Sytar, O., Zerbo, P., Brestic, M., Patrick, V.D., Gagniuc, P. and Barro, N. 2014. Free radicals scavenging capacity, antidiabetic and antihypertensive activities of flavonoid-rich fractions from leaves of *Trichilia emetica* and *Opilia amentacea* in an animal model of type 2 diabetes mellitus. Evidence-based Complementary and Alternative Medicine 2014: Article ID 867075. (http://www.hindawi.com/journals/ecam/2014/867075/) [*O. amentacea showed in vitro* and *in vivo* antioxidant and antihypertensive potential and antilipidemia and antihyperglycemia activities in an animal model of type 2 diabetes mellitus, though the results were less pronounced than those for *T. emetica* (Meliaceae).]

Korkotian, E., Botalova, A., Odegova, T., Galishevskaya, E., Skryabina, E. and Segal, M. 2015. Complex effects of aqueous extract of *Melampyrum pratense* and of its flavonoids on activity of primary cultured hippocampal neurons. Journal of Ethnopharmacology 163: 220-228. [*M. pratense* is widely used in traditional medicine as a sedative. Studies with rat hippocampal neurons suggest that a main sedative effect is on GABAergic neurotransmission, i.e. via γ-aminobutyric acid, the chief inhibitory neurotransmitter in the mammalian central nervous system.]

Korkut, Ö. and Erentürk, S. 2015. Improving oxidation stability of sunflower biodiesel by partial hydrogenation using a special catalyst. Biofuels, Bioproducts & Biorefining, 9(3): 326-334. [Describing a procedure involving activated carbon made from *Viscum album*.]

Kouakou, C.K., Akanvou, L., Bi, I.A.Z., Akanvou, R. and N'da, H.A. 2015. (*Striga* species distribution and infestation in cereal food crops of northern Côte d'Ivoire.) (in French) Cahiers Agricultures 24(1): 37-46. [A useful but alarming survey of *Striga* occurrence in Côte d'Ivoire suggesting that that there is increasing occurrence in the south of the country. A zone covering over 3M ha is now infested. Within this zone, 72% of villages and 57% of cereal crops are affected , mainly by *S. hermonthica* (97%) with lesser occurrence of *S. aspera* (2%) and *S. asiatica* (1%, including some red-flowered in rice). *S. gesnerioides* is not reported in cowpea. *S. hermonthica* severely infested maize (108,160 ha), millet (38,300 ha), sorghum (30,360 ha) and upland rice (91,430 ha). The infestation rates under millet, maize, sorghum and upland rice were 65.9%, 56.5%, 51.0%and 40.5% respectively.]

Kouassi, K., N'dah, K.J., Boyvin, L., Méité, S., Yapo, A.F. and N'guessan, J.D. 2015. Hepatoprotective and *in vivo* antioxidant activity of *Olax subscorpioidea* Oliv. (Olacaceae) and *Distemonathus benthamianus* Baill. (Caesalpiniaceae). Pharmacognosy Magazine 11(41): 111-116. [*O. subscorpioidea* is used in traditional medicine in Côte d'Ivoire for the treatment of many diseases including jaundice and hepatitis. Results confirm hepatoprotective and *in vivo* antioxidant activity in rats.]

Krause K. 2015. Grand-scale theft: Kleptoplasty in parasitic plants? Trends in Plant Science 20:196-198. [Based on experimental data from photosynthetic model plants, the author speculates about the possibility that *Rafflesia* has sequestered whole plastids from its host.]

Krechowski, J., Piórek, K., Falkowski, M. and Wierzba, M. 2015. (Vegetation of the 'Mierzwice' nature reserve and its protection.) (in Polish) Leśne Prace Badawcze 76(2): 168-179. [Noting the presence of the protected species *Thesium ebracteatum*.]

Kudra, A., Chemining'wa, G.A. and Onwonga, R.N. 2014. Relationships between agronomic practices, soil chemical characteristics and *Striga* reproduction in dryland areas of Tanzania. Jouirnal of Agricultural Sciences and Technology 2: 1134-1141. [Apparently some indication that increased potassium levels increased *Striga* infestation, but not clear what species of *Striga* involved, nor in which crop it was occurring. In view of the following, presumably *S. asiatica* in sorghum.]

Kudra, A., Chemining'wa, G.A.,Onwonga, R.N. and Sibuga, K.P. 2014. Influence of fertilizers on *Striga asiatica* reproduction and sorghum grain yield in Dodoma, Tanzania. East African Agriculture and Forestry Journal 80(3): 149-156. [Confirming that application of farmyard manure, chicken manure, urea or triple superphosphate each reduced *S. asiatica* seed production while sorghum yield was significantly increased by chicken manure 2.5 t/ha.]

Kudra, A., Chemining'wa, G.A. and Sibuga K.P. 2014. *Striga asiatica* growth and seed production in response to organic and inorganic P-fertilizers. Access International Journal of Agricultural Sciences 2(1): 6-12. [Apparently the same work as above.]

Kuijt, J. 2015. Santalales. Pages 1-189 in Kubitzki, K, ed. The families and genera of vascular plants. XII Flowering plants: eudicots Santalales, Balanophorales, vol. 12. Cham Switzerland: Springer International Publishing. [A review of many aspects of the largest order of parasites, including information on their morphology, anatomy, fruits, seeds, seedlings, germination, parasitism, ethnobotany, and the author's own view on their classification. The section on chemosystematics was written by K. Kubitzki; Balanophoraceae by B. Hansen and K. Kubitzki.]

Kuijt J. 2015. New synonyms and comments on *Phoradendron* (Viscaceae). Phytologia 97(3):246-251. [Four previously published species are considered synonyms of P. bolleanum and five other names were synonymized. An amended description, illustration, and neotype are provided for P. calvinii Wiens.]

Külheim, C., Jones, C.G., Plummer, J.A., Ghisalberti, E.L., Barbour, L. and Bohlmann, J. 2014. Foliar application of methyl jasmonate does not increase terpenoid accumulation, but weakly elicits terpenoid pathway genes in sandalwood (*Santalum album* L.) seedlings. Plant Biotechnology 31(5): 585-591.

Kullačová, D. and Matúšová, R. 2015.Establishment of *Phelipanche ramosa* tissue culture and effect of kanamycin on culture growth. Journal of Microbiology, Biotechnology and Food Sciences 4(Special Issue 2):

63-65. [In this study i*n vitro* cultures of *P. ramosa* were established on solid and liquid media in parallel. Results point out that development of *P. ramosa* calli was origin specific. The effect of antibiotic kanamycin on *in vitro* cultures of *P. ramosa* was examined with the aim to develop system for its genetic manipulation and selection of transgenic tissue using kanamycin-resistance approach. The selection pressure of kanamycin was stronger in liquid grown cultures.]

Lachia, M., Wolf, H.C., Jung, P.J.M., Screpanti, C. and de Mesmaeker, A. 2015. Strigolactam: new potent strigolactone analogues for the germination of *Orobanche cumana*. Bioorganic & Medicinal Chemistry Letters 25(10): 2184-2188. [Decribing the synthesis of strigolactams 1 and 16 and their 'surprisingly good activity' on the germination of *Orobanche cumana* (Structures available on http://www.sciencedirect.com/science/article/pii/S0960894X15002620

Larsen, B.H.V., Soelberg, J. and Jäger, A.K. 2015. COX-1 inhibitory effect of medicinal plants of Ghana. South African Journal of Botany 99: 129-131. [Extracts of *Thonningia sanguinea* (Balanophoraceae) showed over 90% inhibition of COX-1 activity at 0.1 µg/µL lending support to its use the traditional medicine system in Ghana.]

Lechat, M-M., Brun, G., Montiel, G., Véronési, C., Simier, P., Thoiron, S., Pouvreau, J-B. and Delavault, P. 2015. Seed response to strigolactone is controlled by abscisic acid-independent DNA methylation in the obligate root parasitic plant, *Phelipanche ramosa* L. Pomel. Journal of Experimental Botany 66(11): 3129-3140. [Seed dormancy release of the obligate root parasitic plant, *P. ramosa*, requires a minimum 4-day conditioning period followed by stimulation by host-derived germination stimulants, such as strigolactones. Germination is then mediated by germination stimulant-dependent activation of *PrCYP707A1*, an abscisic acid catabolic gene. The molecular mechanisms occurring during the conditioning period that silence *PrCYP707A1* expression and regulate germination stimulant response are almost unknown. Here it is shown that the DNA methylation status during the conditioning period plays a crucial role independently of abscisic acid in the regulation of *P. ramosa* seed germination by controlling the strigolactone-dependent expression of *PrCYP707A1*.]

Lepší, M. and Lepší, P. 2014. (Records of interesting and new plants in the South Bohemian flora XX.) (in Czech) Sborník Jihočeského Muzea v Českých Budějovicích, Přírodní Vědy 54: 101-121. [Reporting new localities for *Viscum album* subsp. *album*.]

Li HaiZhen, Hou Zhun, Li Chao, Zhang Yao, Shen Tao, Hu QingWen and Ren DongMei. 2015. Three pairs of diastereoisomeric flavanone glycosides from *Viscum articulatum*. Fitoterapia 102: 156-162.

Li HongWu, Zhu Hui, Zhang ChongHai, Zhu WenYuan and Xia MingYu. 2014. (The effect of *Paeonia veitchii* Lynch and *Cuscuta chinensis* Lam extract on tyrosinase activity and expression of mRNA in guinea pig melanocytes.) (in Chinese) Chinese Journal of Dermatovenereology 28(12): 1216-1219. [Concluding that an ethanol extract of *C. chinensis* can up-regulate melanocyte tyrosinase activity and mRNA expression, and then induce the generation of cutaneous melanin, thus showing potential for treating pigmental disorders such as vitiligo.]

Li ZhenHua, Long Ping, Bai Sarula, Yang DaWei, Zhu Hong, Cui ZhanHu, Zhang ChunHong and Li MinHui. 2014. Chemical constituents from *Cymbaria dahurica* L. (Scrophulariaceae). Biochemical Systematics and Ecology 57: 11-14. [Sixteen compounds, including 12 flavonoids and 4 iridoids, were extracted from the hemiparasite *Cymbaria dahurica* (now in Orobanchaceae).]

Lira-Noriega, A., Toro-Núñez, O., Oaks, J.R. and Mort, M.E. 2015. The roles of history and ecology in chloroplast phylogeographic patterns of the bird-dispersed plant parasite *Phoradendron californicum* (Viscaceae) in the Sonoran DesertAmerican Journal of Botany 102(1): 149-164. [Variation in noncoding cpDNA across the species range results from the interplay of vicariant events, past climatic oscillations, and more dynamic factors related to ecological processes at finer temporal and spatial scales.]

Liu Gang, Li YaHuan, Guo Rong, Li ZhengYang and Zhang HongMei 2014. (Optimization of extraction technology of ursolic acid from *Cynomorium songaricum* Rupr. with response surface method.) (in Chinese) Journal of Jilin Agricultural University 36(6): 723-729. [Describing an extraction rate giving over 97%.]

Liu, J., He, H., Vitali, M., Visentin, I., Charnikhova, T., Haider, I., Schubert, A., Ruyter-Spira, C., Bouwmeester, H.J., Lovisolo, C. and Cardinale, F. 2015. Osmotic stress represses strigolactone biosynthesis in *Lotus japonicus* roots: exploring the interaction between strigolactones and ABA under abiotic stress. Planta 241(6): 1435-1451. [In *L. japonicus*, SL-depleted plants showed increased stomatal conductance, both under normal and stress conditions, and impaired resistance to drought associated with slower stomatal closure in response to abscisic acid (ABA). This confirms that SLs contribute to drought resistance in species other than *Arabidopsis*. However, osmotic stress rapidly and strongly decreased SL concentration in tissues and exudates of wild-type *Lotus* roots, by acting on the transcription of biosynthetic and transporter-encoding genes and independently of phosphate abundance. It was proposed that a transcriptionally regulated, early SL decrease under osmotic stress is needed (but not sufficient) to allow the physiological increase of ABA in roots. This work shows that SL metabolism and effects on ABA are seemingly opposite in roots and shoots under stress.]

Liu QuanYu, Wang Fei, Zhang Lei, Xie JieMing, Li Peng and Zhang YongHong. 2015. A hydroxylated lupeol-based triterpenoid ester isolated from the *Scurrula parasitica* parasitic on *Nerium indicum*. Helvetica

Chimica Acta 98(5): 627-632. [A range of compounds were isolated from *S. parasitica*, six of which showed activity against cancer cell lines, PANC-1, HL-60, and SGC-7901, Activity apparently depended on the 3-OH group in lupeol-based triterpenoids.]

Liu Xing, Li XiaoHong, Wang Yan and Zou CongCong. 2014. (Effect of *Cuscuta chinensis* Lam medicated serum on rat embryo limb bud cells and expressions of BMP-2 and collagen II.) (in Chinese) Journal of Shandong University (Health Sciences) 52(7): 37-40.

Liu Yang, Xiu XiaoYou and Wang WeiYun 2015. (Optimization of phenylethyl alcohol glycosides extraction process from *Cistanche tubulosa* by response surface analysis (RSA).) (in Chinese) Journal of Anhui Agricultural University 42(2): 294-298. [Microwave extraction method showed the highest yield of phenylethyl alcohol glycosides in the shortest time, followed by the ultrasonic extraction method. The ethanol extraction method showed the lowest efficiency.]

Lone, Z.A., Yaqoob Lone, Khan, S.S., Wani, A.A. and Reshi, M.I. 2015. Hepatoprotective medicinal plants used by the Gond and Bhill tribals of district Raisen Madhya Pradesh, India. Journal of Medicinal Plants Research 9(12): 400-406. ['Important species for the alleviation of hepatic disorders' in this district include *Cuscuta reflexa*.]

Lucero, F., Botto-Mahan, C., Medel, R., and Fontúrbel, F.E. 2014. New insights on the mistletoe *Tristerix aphyllus* (Loranthaceae): interaction with diurnal and nocturnal frugivorous species. Gayana Botánica 71(2): 270-272. [Most visitors to *T. aphyllus* on its cactus host *Echinopsis chiloensis* were 5 species of diurnal birds especially *Mimus thenca*. Two small nocturnal mammals were also recorded, and the marsupial *Thylamys elegans*. Only *M. thenca* is a certain disperser.]

Ma, J., Pawar, R.S., Grundel, E., Mazzola, E.P., Ridge, C.D., Masaoka, T., le Grice, S.F.J., Wilson, J., Beutler, J.A. and Krynitsky, A.J. 2015. Sesquiterpenoid tropolone glycosides from *Liriosma ovata*. Journal of Natural Products 78(2): 315-319. [Two new compounds identified in *L. ovata* (Olacaceae).]

Ma YongQing, Zhang Meng, Li YaoLin, Shui JunFeng and Zhou YongJun. 2014. Allelopathy of rice (*Oryza sativa* L.) root exudates and its relations with *Orobanche cumana* Wallr. and *Orobanche minor* Sm. germination. Journal of Plant Interactions 9(1): 722-730. [Demonstrating a correlation between the allelopathic effects of rice varieties and the stimulating effects of the root exudates on germination of *O. cumana* and *O. minor*, suggesting an *Orobanche*-germinating assay as a useful screening tool for selection of allelopathic rice varieties.]

Ma YueFeng, Guo ChengLin, Ma YongLin, Qin JianLin, Lu RongSheng, Du XiaoLi, Huang XuGuang, Luo EnBo, Lu Qian, Li Gang, Wei LuYi and Yang SiXia. 2014. (Investigation and analysis on garden dodder damage situation in Guangxi.) (in Chinese) Journal of Southern Agriculture 45(12): 2001-2006. [In a survey of 16 cities *Cuscuta chinensis*, *C. japonica*, *C. reflexa* and *Cassytha filiformis* were recorded on 62 hosts. *C. japonica* was the predominant problem.]

*Maikai, V.A., Maikai, B.V. and Kobo, P.I. 2014. *In vitro* effect of aqueous extract and fraction IV portion of *Ximenia americana* stem bark on *Trypanosoma congolense* DNA. Journal of Parasitology Research 2014: Article ID 904318. (http://www.hindawi.com/journals/jpr/2014/904318/) [Confirming 55 and 90% immobilisation of *T. congolense*, by aqueous and 'IV' fractions (not defined) respectively from *X. americana*.]

Makumbi, D., Diallo, A., Kanampiu, F., Mugo, S. and Karaya, H. 2015. Agronomic performance and genotype × environment interaction of herbicide-resistant maize varieties in eastern Africa. Crop Science 55(2): 540-555. [In trials involving both *Striga hermonthica* and *S. asiatica* the best IR (imidazolinone-resistant) maize variety, STR-VE-216, with herbicide seed-dressing out-yielded the *Striga*-tolerant and commercial genotypes by 113 and 89%, respectively, under *Striga*-infested conditions. Genotype × environment interactions were generally low.]

Manickavasagam, S. and Rameshkumar, A. 2013. Four new species of *Gonatocerus* Nees (Hymenoptera: Mymaridae) and a key to the species of *asulcifrons* group from India. Oriental Insects 47(1): 86-98. [Apparently occurring on *Santalum* spp.]

Manoj Kumar, Pandya-Kumar, N., Dam, A., Haor, H., Mayzlish-Gati, E., Belausov, E., Wininger, S., Abu-Abied, M., McErlean, C.S.P., Bromhead, L.J., Prandi, C., Kapulnik, Y. and Koltai, H. 2015. *Arabidopsis* response to low-phosphate conditions includes active changes in actin filaments and PIN2 polarization and is dependent on strigolactone signalling. Journal of Experimental Botany 66(5): 1499-1510. [PIN2 expression, PIN2 plasma membrane localization, endosome trafficking, and actin bundling were examined under low-Pi conditions: a MAX2-dependent reduction in PIN2 trafficking and polarization in the PM, reduced endosome trafficking, and increased actin-filament bundling were detected in root cells. Exogenous supplementation of the synthetic SL GR24 to a SL-deficient mutant (*max4*) led to depletion of PIN2 from the PM under low-Pi conditions. It was suggested that changes in PIN2 polarity, actin bundling, and vesicle trafficking are involved in the response to low Pi in roots, dependent on SL/MAX2 signaling.]

Maranho, Á.S. and de Paula, S.R.P. 2014. (Diversity in an urban green area: qualitative evaluation of urban forest of the Federal University of Acre campus, Brasil.) (in Portuguese) Agro@mbiente On-line 8(3): 404-415. [Noting that *Oryctanthus florulentus* and *Phthirusa stelis* were frequent parasites in city trees, the latter predominant, occurring in 27% of the surveyed trees, *Caesalpinia peltophoroides* being the most frequent host followed by *Mangifera indica* and *Terminalia catappa*.]

Marenco, R.A., Nascimento, H.C.S. and Magalhães, N.S. 2014. Stomatal conductance in Amazonian tree saplings

in response to variations in the physical environment. Photosynthetica 52(4): 493-500. [*Minquartia guianensis* (Olacaceae) among species studied.]

Marias, D.E., Meinzer, F.C., Woodruff, D.R., Shaw, D.C., Voelker, S.L., Brooks, J.R., Lachenbruch, B., Falk, K. and McKay, J. 2014. Impacts of dwarf mistletoe on the physiology of host *Tsuga heterophylla* trees as recorded in tree-ring C and O stable isotopes. Tree Physiology 34(6): 595-607.[Reporting a long-term study of infected and uninfected western hemlock. Uninfected trees grew more rapidly than infected but rapidly declined in growth as measured in growth rings and leaf level photosynthesis.]

Marinho, L.C., de Oliveira, R.P. and Giulietti, A.M. 2014. (Flora da Bahia: Krameriaceae.) (in Portuguese) Sitientibus - Série Ciências Biológicas 2014: 14pp. [*Krameria argentea*, *K. bahiana*, *K. grandiflora*, and *K. tomentosa* are described and illustrated and a key provided.]

Martínez Monseny, A., Martínez Sánchez, L., Margarit Soler, A., de la Sainz Maza, V.T., Luaces Cubells, C. 2014. (Poisonous plants: an ongoing problem.) (in Spanish) Anales de Pediatría 82(5): 347-353. [Describing cases of poisoning, including one at least from mistletoe, presumably *Viscum album*.]

Masirevic, S., Medic-Pap, S., Konstantinovic, B. and Terzic, A. 2015. Influence of nutritive media and low temperatures on broomrape seed germination. Bulgarian Journal of Agricultural Science 21(1): 100-104. [Highest germination of *Orobanche cumana* seeds was observed on the agar medium with gibberelic acid in the presence of sunflower roots. Cooling of broomrape seeds to 4°C for 21 day stimulated germination and average radicle length.]

Mathiasen, R.L. and Kenaley, S.C. 2015. A morphometric analysis of dwarf mistletoes in the *Arceuthobium campylopodum-occidentale* complex (Viscaceae). Madroño 62(1): 1-20. [Discussing the complex of four closely-related taxa: *A. campylopodum*, *A. occidentale*, *A. littorum* and *A. siskiyouense*, parasites on 'hard' pines (a range of *Pinus* species) and concluding from a range of studies that *A. littorum* and *A. siskiyouense* are clearly distinct. *A. campylopodum* and *A. occidentale* are more problematic but are considered separable and a guide to their separation is provided.]

Matsuo, Y., Sakagami, H. and Mimaki, Y. 2014. A rare type of sesquiterpene and β-Santalol derivatives from *Santalum album* and their cytotoxic activities. Chemical & Pharmaceutical Bulletin 62(12): 1192-1199. [*cis*-β-santalol and β-santaldiol induced apoptotic cell death in HL-60 human leukemia cells.]

Matusova, R., Kullačová, D. and Tóth, P. 2014. Response of weedy and non-weedy broomrapes to synthetic strigolactone analogue GR24. Journal of Central European Agriculture 15(4): 72-82. [Seeds of *Phelipanche ramosa* and *P. purpurea* were highly sensitive to GR24. However, germination of several wild species, *Orobanche alba*, *O. caryophyllacea* and *P. arenaria* was low, while the stimulant was completely ineffective on other non-weedy species *O. alsatica*, *O. elatior*, *O. flava*, *O. lutea*, *O. pallidiflora*, and *O. reticulata.* The hosts from which these species were collected is indicated.]

Medina-Pérez, V., López-Laredo, A.R., Sepúlveda-Jiménez, G., Zamilpa, A. and Trejo-Tapia, G. 2015. Nitrogen deficiency stimulates biosynthesis of bioactive phenylethanoid glycosides in the medicinal plant *Castilleja tenuiflora* Benth. Acta Physiologiae Plantarum 37(5): 93. [*C. tenuifolia* is a source of phenylethanoid glycosides (PhGs), promising natural products for chronic disease treatment. This study confirmed that verbascoside and isoverbascoside were enhanced under N deficiency.]

Mennes, C.B., Moerland, M.S., Rath, M., Smets, E.F. and Merckx, V.S.F.T. 2015. Evolution of mycoheterotrophy in Polygalaceae: the case of *Epirixanthes*. American Journal of Botany 102(4): 598-608. [Confirming *Epirixanthes* as sister to the chlorophyllous *Salomonia* in the tribe Polygaleae.]

Mesbah, N. and Noorhosseini, S.A. 2014. Effect of nitrogen fertilizers on the yield of host plant, sunflower (*Helianthus annuus*) in presence of parasitic plant (*Orobanche aegyptiaca*). Research Journal of Biological Sciences 9(5): 188-192. [In a pot experiment in Iran, various forms of N at 2-5 ppm reduced *O. aegyptiaca* and increased sunflower growth.]

Messias, P.A., Vidal Júnior, J.de D., Koch, I. and Christianini, A.V. 2014. Host specificity and experimental assessment of the early establishment of the mistletoe *Phoradendron crassifolium* (Pohl ex DC.) Eichler (Santalaceae) in a fragment of Atlantic Forest in southeast Brazil. Acta Botanica Brasilica 28(44): 577-582. [Although *Lithraea molleoides*, *Tapirira guianensis* and *Siparuna guianensis* were the commonest hosts, *P. crassifolium* appeared to have a wide host range and its prevalence or lack of it is more dependent on dispersal limitation than on mistletoe-host compatibility.]

Miao ZhongQin, Zhao DongPing and Guo YuHai. 2014. (Pectinase and cellulase produced by the parasite plant *Cistanche tubulosa* are involved in parasitising its host root.) (in Chinese) Journal of China Agricultural University 19(6): 88-94. [Confirming that pectinase and cellulase are involved in the invasion of the root of *Tamarix chinesis* by *C. tubulosa* haustoria.]

Míguez, F., Fernández-Marín, B., Hernández, A., Becerril, J.M. and García-Plazaola, J.I. 2015. Does age matter under winter photoinhibitory conditions? A case study in stems and leaves of European mistletoe (*Viscum album*). Functional Plant Biology 42(2): 175-185. [Confirming the idea of stems as main photosynthetic organs in *V. album* during winter.]

Mishra Deepak, Mishra Pratima and Awasthi Arpita. 2014. Chromatographic finger print analysis, phyto-chemical and microbicidal screening, of an important medicinal plant of Vindhya Region - *Santalum album* Linn. Online International Interdisciplinary Research Journal 4(Special Issue (January)): 237-246.

Mohammadi, A. 2014. Biological control of *Orobanche ramosa* by *Fusarium solani*. International Journal of Advanced Biological and Biomedical Research 2(11): 2751-2755. [Isolates of *F. solani* from diseased *O. ramosa* on tomato, eggplant, melon, and watermelon fields in Southern Khorasan were tested and found pathogenic to all stages of the parasite. But no mention of crop safety.]

*Mohsen Marvibaigi, Eko Supriyanto, Neda Amini and Fadzilah Adibah, A.M. 2014. Preclinical and clinical effects of mistletoe against breast cancer. BioMed Research International 2014: Article ID 785479. (http://www.hindawi.com/journals/bmri/2014/785479/) [Reviewing the benefits of *Viscum album*-based therapy in treatment of breast cancer and concluding there is 'evidence that there might be a combination of pharmacological and motivational aspects mediated by the mistletoe extract application which may contribute to the clinical benefit and positive outcome such as improved quality of life and self-regulation.']

Molehin, O.R. and Adefegha, S.A. 2015. Antioxidant and inhibitory effects of aqueous and ethanolic extract of *Tapinanthus bangwensis* leaves on $Fe^{2+}$-induced lipid peroxidation in pancreas (*in vitro*). International Food Research Journal 22(1): 269-274. [Aqueous and ethanolic extracts of *T. bangwensis* showed antioxidant effects with potential to protect the pancreas against oxidative damage in rats, the aqueous extract being the more effective.]

Mony, R., Tchatat, M., Massako, F. and Dibong, S.D. 2014. (Safou parasitism by *Tapinanthus* on Logbessou's plateau (Douala, Cameroon).) (in French) Tropicultura 32(4): 177-182. [A survey establishing that 'safou' – *Dacryodes edulis* (Burseraceae), butterfruit in English - is extensively parasitized by *Tapinanthus ogowensis* and by *T. preussii*.]

Morais-Costa, F., Bastos, G.A., Soares, A.C.M., Nunes, Y.R.F. and Geraseev, L.C. 2015. (Influence of structure of vegetation in the selection of diet by sheep in Cerrado area.) (in Portuguese) Revista Caatinga 28(2): 188-196. [*Ximenia americana* among species most favoured by sheep in this region of Brazil.]

Mothana, R.A., Al-Musayeib, N.M., Al-Ajmi, M.F., Cos, P. and Maes, L. 2014. Evaluation of the *in vitro* antiplasmodial, antileishmanial, and antitrypanosomal activity of medicinal plants used in Saudi and Yemeni traditional medicine. Evidence-based Complementary and Alternative Medicine 2014: Article ID 905639. (http://www.hindawi.com/journals/ecam/2014/905639/) [Extracts of '*Loranthus regularis*' (= *Phragmanthera regularis*) exhibited moderate activity against *Trypanosoma brucei*.]

Mounde, L.G., Boh, M.Y., Cotter, M. and Rasche, F. 2015. Potential of rhizobacteria for promoting sorghum growth and suppressing *Striga hermonthica* development. Journal of Plant Diseases and Protection 122(2): 100-106. [In the absence of *Striga*, the studied bacteria cause some stimulation of sorghum growth, and 3 of the 4 - *Bacillus subtilis* GBO3, *B. amyloliquefaciens* FZB42 and *Burkholderia phytofirmans* PsJN showed promising potential to promote sorghum growth and suppress *Striga* germination, attachment and survival.]

Moupela, C., Doucet, J.L. Daïnou, K., Brostaux, Y., Fayolle, A. and Vermeulen, C. 2014. Reproductive ecology of *Coula edulis* Baill., source of a valuable non-timber forest product. Tropical Ecology 55(3): 327-338. [Fruit production in *C. edulis* (Olacaceae) shown to be closely correlated with tree diameter.]

Moupela, C., Doucet, J.L., Daïnou, K., Meunier, Q. and Vermeulen, C. 2013. (Propagation trials with *Coula edulis* Baill. using seeds and air layering; prospects for domestication.) (in French) Bois et Forêts des Tropiques 318: 3-13. [Germination of *C. edulis*, African walnut, is low and fails to respond to pre-treatments, whereas air layering proves highly successful.]

**Murage, A.W., Midega, C.A.O., Pittchar, J.O., Pickett, J.A. and Khan, Z.R. 2015. Determinants of adoption of climate-smart push-pull technology for enhanced food security through integrated pest management in eastern Africa. Food Security 7(3): 709-724. [The new 'climate-smart push-pull' involves the more drought tolerant *Desmodium intortum* with *Brachiaria* cv *mulato* II as the border crop. This detailed socio-economic study suggested that the revised technology should be acceptable and profitable (marginal rate of return over 100% for sorghum and maize) over considerable areas of *Striga hermonthica*-infested Kenya, Tanzania and Ethiopia, with gender, perceptions of *Striga* severity, technology awareness and input market access the most likely factors that would positively influence the decision to adopt.]**

Musyoki, M.K., Cadisch, G., Enowashu, E., Zimmermann, J., Muema, E., Beed, F. and Rasche, F. 2015. Promoting effect of *Fusarium oxysporum* [f.sp. *strigae*] on abundance of nitrifying prokaryotes in a maize rhizosphere across soil types. Biological Control 83: 37-45. [It was concluded that 'Foxy-2 *F. oxysporum* did not pose a negative effect on targeted indigenous microorganisms, but the underlying mechanisms for the observed promoting effect of ammonia-oxidizing archaea abundance are yet to be understood.]

Musselman, L.J. 2014. Japanese dodder, *Cuscuta japonica*. Cinquapin. The Newsletter of the Southern Appalachian Botanical Society 22(4): 1. [Describing and illustrating a new occurrence of *C. japonica* on live oak (*Quercus virginiana*) in Texas, USA. This infestation is flowering unlike those recently reported California.]

Mustarichie, R., Warya, S., Saptarini, N.M. and Ramdhani, D. 2015. Total flavonoid content and anti-inflammatory properties of Indonesian mistletoes (*Dendrophthoe pentandra* (L.) Miq.) ethanol extract. World Journal of Pharmaceutical Research 4(4): 287-302. [*D. pentandra* is used traditionally in Indonesia to cure coughs, hypertension, diabetes, cancer, ulcers, smallpox, diuretic, skin infection and after child-birth. The study identified quercetin as the probable agent providing anti-inflammatory activity.]

Musyoki, M.K., Cadisch, G., Enowashu, E., Zimmermann, J., Muema, E., Beed, F. and Rasche, F. 2015. Promoting effect of *Fusarium oxysporum* [f.sp. *strigae*] on abundance of nitrifying prokaryotes in a maize rhizosphere across soil types. Biological Control 83: 37-45. [Concluding that *F. oxysporum* (Foxy-2) applied to soil for control of *Striga hermonthica* did not pose a negative effect on targeted indigenous microorganisms, but the underlying mechanisms for an observed promoting effect on ammonia-oxidizing archaea (AOA) by Foxy-2 inoculation are yet to be understood.]

Muvengwi, J., Ndagurwa, H.G.T. and Nyenda, T. 2015. Enhanced soil nutrient concentrations beneath-canopy of savanna trees infected by mistletoes in a southern African savanna. Journal of Arid Environments 116: 25-28. [Showing that soil fertility was higher under 'mistletoe'-infected *Sclerocarya birrea* and *Diospyros mespiliformis* than under uninfested trees in southern Africa but mistletoe species not defined.]

Mwangi, B., Obare, G. and Murage, A. 2014. Estimating the adoption rates of two contrasting *Striga* weeds control technologies in Kenya. Quarterly Journal of International Agriculture 53(3): 225-242. [A survey of 326 maize farmers in Western Kenya found 37% using push-pull technology, involving the use of *Desmodium* and 36.3% using Imidazolinone-resistant maize treated with herbicide. Potential take-up was estimated at 56% and 46% respectively.]

N'cho, S.A. 2014. Socio-economic impacts and determinants of parasitic weed infestation in rainfed rice systems of sub-Saharan Africa. PhD Thesis. Wageningen, Netherlands: Wageningen University). 160 pp. [Parasitic weeds (apparently predominantly *Rhamphicarpa fistulosa*) cause crop losses ranging from 21% to 50% and are not being adequately controlled by the current hand-weeding procedures. Preferable 'improved weed management practices' are mentioned but not defined in the abstract.]

Ndagurwa, H.G.T., Dube, J.S. and Mlambo, D. 2015. Decomposition and nutrient release patterns of mistletoe litters in a semi-arid savanna, southwest Zimbabwe. Austral Ecology 40(2): 178-185. [Studying the decomposition and nutrient dynamics of litter of *Erianthemum ngamicum*, *Plicosepalus kalachariensis*, *Viscum verrucosum* and *Acacia karroo* in southwest Zimbabwe. Decay rates were higher for the mistletoe spp. than for *A. karoo* suggesting that they play an important role in carbon and nutrient fluxes in semi-arid savanna.]

*Negero Gemeda and 11 others. 2014. Insecticidal activity of some traditionally used Ethiopian medicinal plants against sheep ked *Melophagus ovinus*. Journal of Parasitology Research 2014: Article ID 978537. (http://www.hindawi.com/journals/jpr/2014/978537/) [*Ximenia caffra* is among plants used traditionally to control *M. ovinus* (a tick-like fly) but in this study of 12 specis, *X. caffra* was relatively ineffective.]

Nobis, M. and 15 others. 2015. Contribution to the flora of Asian and European countries: new national and regional vascular plant records, 3. Acta Botanica Gallica 162(2): 103-115. [Recording *Orobanche alba* ssp. *xanthostigma*) from Georgia.]

Nwaehujor, C.O., Ode, J.O., Nwinyi, F.C. and Asuzu, O.V. 2014. Mechanism of action involved in the hepatoprotective activities of methanol extract of *Cassytha filiformis* L. aerial parts in $CCl_4$-induced liver damage. Comparative Clinical Pathology 23(6): 1749-1755. [Extracts of *C. filiformis* are used in Nigeria to treat liver disorders including hepatitis and alcohol intoxication. Findings of this study suggest that a methanol extract of *C. filiformis* could be useful in protecting hepatocytes from toxins especially from alcohol intoxication.]

Ogunmefun, O.T., Olatunji, B.P. and Adarabioyo, M.I. 2015. Ethnomedicinal survey on the uses of mistletoe in South-western Nigeria. European Journal of Medicinal Plants 8(4): 224-230. [This study confirms the local beliefs in the merits of a range of mistletoes harvested from cocoa and *Cola* spp. including *Phragmanthera*, *Agelanthus*, *Globimetula* and *Tapinanthus* spp. for the treatment of diabetes, hypertension, insomnia and infertility but gives no details on individual species.]

*Ogunkunle, A.T.J., Oyelakin, T.M., Enitan, A.O. and Oyewole, F.E. 2014. A quantitative documentation of the composition of two powdered herbal formulations (antimalarial and haematinic) using ethnomedicinal information from Ogbomoso, Nigeria. Evidence-based Complementary and Alternative Medicine, 2014: Article ID 751291. (http://www.hindawi.com/journals/ecam/2014/751291/) [*Cassytha filiformis* one of the components of the multi-component antimalarial herbal concoction (Maloff-HB).]

Olaniyan, A.B. 2015. Maize: panacea for hunger in Nigeria. African Journal of Plant Science 9(3): 155-174. [Noting that the increasing popularity of maize in more northern parts of Nigeria is threatened by attack from *Striga* spp.]

Orhan, D.D., Senol, F.S., Hosbas, S. and Orhan, I.E. 2014. Assessment of cholinesterase and tyrosinase inhibitory and antioxidant properties of *Viscum album* L. samples collected from different host plants and its two principal substances. Industrial Crops and Products 62: 341-349. [Aqueous and methanol extracts of *V. album* displayed strong antioxidant activity in DPPH and DMPD radical quenching tests as well as FRAP and metal-chelation capacity assays. No indication of differences according to host plant. Study conducted in Turkey.]

Özdemir, E. and Alpınar, K. 2015. An ethnobotanical survey of medicinal plants in western part of central Taurus Mountains: Aladaglar (Nigde - Turkey). Journal of Ethnopharmacology 166: 53-65. [*Viscum album* subsp. *abietis* among the most commonly used medicinal plants in the region.]

Palasuwan, A. and Soogarun, S. 2014. Total antioxidant activity of Thai medicinal plants associated with the treatment of cardiovascular diseases, diabetes and cancers. Journal of Chemical and Pharmaceutical

Research 6(10): 27-3. [Recording relatively high antioxidant activity in *Balanophora abbreviata*.]

Patrick-Iwuanyanwu, K.C., Onyeike, E.N. and Adhikari, A. 2014. Isolation, identification and characterization of gallic acid derivatives from leaves of *Tapinanthus bangwensis*. Journal of Natural Products (India) 7: 14-19. [Describing the isolation of three gallic acid derivatives from the ethyl acetate fraction of leaves of *T. bangwensis*, which could be responsible for the therapeutic potential of this species.]

Paudel, P.N. and Rajendra Gyawali. 2014. Phytochemical screening and antimicrobial activities of some selected medicinal plants of Nepal. International Journal of Pharmaceutical and Biological Archives 5(3): 84-92. [The extract of *Osyris wightiana* was among a number of species showing high activity against *Escherichia coli*, *Klebsiella pneumonia*, *Pseudomonas aeruginosa*, *Proteus mirabilis*, *Salmonella typhi* and *Salmonella paratyphi*. It was also active against *Candida albicans* but not against *Trichoderma viridae*.]

Paul, B.N., Pandey, B.K. and Giri, S.S. 2014. Effect of plant based feed attractants on growth of *Cirrhinus mrigala* fingerlings. Animal Nutrition and Feed Technology 14(2): 393-398. ['Awbel', based on *Cuscuta reflexa* proved the best of several plant extracts added to fish food to encourage feeding of *C. mrigala* (white carp).]

Pavlů, V., Pavlů, L. and Fraser, M.D. 2014. Long-term effects of extensification regimes on soil and botanical characteristics of improved upland grasslands. In: Hopkins, A. *et al.* (eds) EGF at 50: The future of European grasslands. Proceedings of the 25th General Meeting of the European Grassland Federation, Aberystwyth, Wales, 7-11 September 2014: 251-253. [Noting that lime application had relatively little effect on plant species composition, but decreased *Rhinanthus minor* which can initiate further steps within the extensification process. The most effective management for grassland biodiversity restoration was hay cutting with aftermath grazing.]

Pichit Khetkam, Xie XiaoNan, Kisugi, T., Kim HyunIl, Yoneyama, K., Uchida, K., Yokota, T., Nomura, T. and Yoneyama, K. 2014. 7α- and 7β-Hydroxyorobanchyl acetate as germination stimulants for root parasitic weeds produced by cucumber. Journal of Pesticide Science 39(3/4): 121-126. [Cucumber found to exude at least 12 germination stimulants including 5 known strigolactones, 7-oxoorobanchol, 7-oxoorobanchyl acetate, orobanchol, orobanchyl acetate, and 4-deoxyorobanchol. 7α- and 7β-hydroxyorobanchyl acetate with activity on *Orobanche minor* comparable to that of orobanchyl acetate. 7β-hydroxyorobanchyl acetate was a highly potent germination stimulant for *Phelipanche ramosa*.]

*Pickett, J.A., Woodcock, C.M., Midega, A,A,O. and Khan, Z.R. 2014. Push–pull farming systems. Current Opinion in Biotechnology 26: 125-132. (http://www.sciencedirect.com/science/article/pii/S0958166913007210) [A detailed review of the 'push-pull' technique for control of stem-borers and *Striga* with emphasis on the possibilities for exploitation on other insect targets.]

***Pineda-Martos, R., Pujadas-Salvà, A.J., Fernández-Martínez, J.M., Stoyanov, K., Velasco, L. and Pérez-Vich, B. 2014. The genetic structure of wild *Orobanche cumana* Wallr. (Orobanchaceae) populations in eastern Bulgaria reflects introgressions from weedy populations. The Scientific World Journal 2014: Article ID 150432. (http://www.hindawi.com/journals/tswj/2014/150432/) [Populations of *O. cumana* were collected from wild hosts – mainly *Artemisia maritima*, but also *A. arvensis* and *Chamaemelum nobile* (also Asteraceae). These populations were not clearly genetically differentiated from populations attacking sunflower and could be equally virulent on crop varieties with resistance to races B to D, though none infected P96 with resistance to race F. Results emphasise the risks of out-crossing with 'wild' populations contributing to breakdown in resistance.]**

Piwowarczyk, R. 2014. *Orobanche flava* (Orobanchaceae) in Poland: current distribution, taxonomy, hosts and plant communities. Biodiversity: Research and Conservation 34: 41-52. [Describing the taxonomy, biology and ecology of *O. flava*, occurring in southern Poland, mainly in the Carpathian mountains and, sporadically, in the Sudeten mountains.]

Piwowarczyk, R. and Krajewski, Ł. 2014. *Orobanche lutea* Baumg. (Orobanchaceae) in Poland: revised distribution, taxonomy, phytocoenological and host relations. Biodiversity: Research and Conservation 34: 17-39. [Describing the taxonomy, biology, ecology and distribution of *O. lutea* in Poland. It is associated especially with highly calcareous soils and with old mining sites with toxic heavy metals.]

Piwowarczyk, R. and Krajewski, Ł. 2015. *Orobanche elatior* and *O. kochii* (Orobanchaceae) in Poland: distribution, taxonomy, plant communities and seed micromorphology. Acta Societatis Botanicorum Poloniae 84(1): 103-123. [Reporting a critical revision of herbarium and literature data on *O. elatior s.l.* in Poland, separating *O. elatior s.s.* from the closely related *O. kochii*. The taxonomy, host preferences (all on *Centaurea* spp.?), and ecology are discussed and diagnostic features of the seeds described.]

Piwowarczyk, R., Madeja, J. and Nobis, M. 2015. Pollen morphology of the Central European broomrapes (Orobanchaceae: *Orobanche*, *Phelipanche* and *Orobanchella*) and its taxonomical implications. Plant Systematics and Evolution 301(2): 795-808. [Palynological data from 25 (18 new) species of *Orobanche* and *Phelipanche* are reported. The pollen of one species, *O. coerulescens*, is divergent prompting the authors to (controversially) segregate it into their newly named genus *Orobanchella*.]

Poczai, P., Varga, I. and Hyvönen, J. 2015. Internal transcribed spacer (ITS) evolution in populations of the hyperparasitic European mistletoe pathogen fungus, *Sphaeropsis visci* (*Botryosphaeriaceae*): the utility of

ITS2 secondary structures. Gene 558(1): 54-64. [Relating to *S. visci* occurring on *V. album* in Hungary.]

Praseeja, R.J., Sreejith, P.S. and Asha, V.V. 2015. Studies on the apoptosis inducing and cell cycle regulatory effect of *Cuscuta reflexa* Roxb chloroform extract on human hepatocellular carcinoma cell line, Hep 3B. International Journal of Applied Research in Natural Products 8(2): 37-47. [Results showed that the extract of *C. reflexa* is able to induce apoptosis in Hep 3B cells in a dose and time dependent manner through the intrinsic mitochondrial apoptotic pathway. It is thus a potential candidate for further development as an anti-HCC drug.]

Pujadas Salvá, A.J. and Triano Muñoz, E. 2014. (*Orobanche subbaetica* Triano & A. Pujadas (Orobanchaceae), a new species from southern Iberian Peninsula, Andalusia, Spain.) (in Spanish) Acta Botanica Malacitana 39: 274-282. [Describing *O. subbaetica* growing on *Antirrhinum litigiosum*. Similar to *O. castellana* and *O. amethystea* but taller and more robust. With detailed description and illustration.]

*Qian ChaoDong, Fu YuHang, Jiang FuSheng, Xu ZhengHong, Cheng DongQing, Ding Bin, Gao ChengXian and Ding ZhiShan. 2014. *Lasiodiplodia* sp. ME4-2, an endophytic fungus from the floral parts of *Viscum coloratum*, produces indole-3-carboxylic acid and other aromatic metabolites. BMC Microbiology 14: 297. (http://www.biomedcentral.com/content/pdf/s12866-014-0297-0.pdf) [Identifying a fungal endophyte of *V. coloratum* as *Lasiodiplodia* sp., based on its molecular biological characteristics. Isolating 5 aromatic compounds from its culture, especially 2-phenylethanol, a common component of floral essential oils. Thus endophytic fungi isolated from plant flowers may be promising natural sources of aromatic compounds.]

Raftoyannis, Y., Radoglou, K. and Bredemeier, M. 2015. Effects of mistletoe infestation on the decline and mortality of *Abies cephalonica* in Greece. Annals of Forest Research 58(1): 55-65. [Showing significantly lower water potentials and higher photochemical efficiencies in *Viscum album* than in Greek fir branches and confirming a correlation between *V. album* infestation and decline of the fir.]

Rahmawati, S.I., Ishimaru, K., Hou DeXing and Hayashi, N. 2014. Antioxidant and anticancer activities of mistletoe tea prepared by high temperature extraction with cyclodextrin. Bulgarian Journal of Agricultural Science 20(4): 818-823. [Addition of hydroxypropyl-b-cyclodextrin (b-CD) to an extract of *Scurrula atropurpurea* led to effective anticancer activity.]

Rafiqul Islam, Rahman, M.S. and Rahman, S.M. 2015. GC-MS analysis and antibacterial activity of *Cuscuta reflexa* against bacterial pathogens. Asian Pacific Journal of Tropical Disease 5(5): 399-403. [Claiming significant antibacterial activity against *Bacillus subtilis, Sarcina lutea, Xanthomonas campestris, Escherichia coli, Klebsiella pneumoniae, Proteus vulgaris* and *Pseudomonas denitrificans*.]

Rahmad, Z.B., Addo-Fordjour, P., Asyraf, M. and Rosely, N.F.N. 2014. Mistletoe abundance, distribution and associations with trees along roadsides in Penang, Malaysia. Tropical Ecology 55(2): 255-262. [In a survey the most abundant mistletoe species was *Scurrula ferruginia* (718 individuals) followed by *Dendrophthoe pentandra* (585 individuals). *Tabebuia pallida* was the most frequently parasitised host.]

Raina, A.K. and Abdul Hamid. 2014. Floristic analysis of Chiktan Valley in Kargil district, Jammu and Kashmir. Environment Conservation Journal 15(3): 71-79. [The flora included 3 *Pedicularis* spp. – *P. pyramidata, P. cheilanthifolia* and *P. scullyana*.]

Ranjan, A., Ichihashi, Y., Farhi, M., Zumstein, K., Townsley, B., David-Schwartz, R., Sinha, N.R., Edwards, R. and Hannah, M. 2014. *De novo* assembly and characterization of the transcriptome of the parasitic weed dodder identifies genes associated with plant parasitism. Plant Physiology 166(3): 1186-1199. [Infection of tomato by *Cuscuta pentagona* is accompanied, in the parasite, by increased expression of genes underlying transport and transporter categories, response to stress and stimuli, as well as genes encoding enzymes involved in cell wall modifications while expression of photosynthetic genes is decreased in the dodder infective stages compared with normal stem. In addition, genes relating to biosynthesis, transport, and response of phytohormones, such as auxin, gibberellins, and strigolactone, are differentially expressed in the dodder infective stages compared with stems and seedlings.]

Rao, J.P., Satish, K.V., Sankar, B.S., Reddy, C.S. and Kumar, O.A. 2015. On the occurrence of parasitic plant *Balanophora fungosa* J.R. Forster & G. Forster (Balanophoraceae) in Andhra Pradesh, India. Journal of Threatened Taxa 7(2): 6943-6946. [Describing the morphology, habitat, flowering and fruiting date, floral associations and distribution of *B. fungosa* in peninsular India, where it is used traditionally for treatment against skin infections and piles.]

Reblin, J.S. and Logan, B.A. 2015. Impacts of eastern dwarf mistletoe on the stem hydraulics of red spruce and white spruce, two host species with different drought tolerances and responses to infection. Trees: Structure and Function 29(2): 475-486. [Exploring why *Arceuthobium pusillum* is more damaging on white spruce (*Picea glauca*) than on red spruce (*P. rubens*). Red spruce apparently protects whole-tree resources from *A. pusillum* by shedding infected branches but this is not due to any greater susceptibility to water stress-induced xylem failure.]

Reif, B.P., Mathiasen, R.L., Kenaley, S.C. and Allan, G.J. 2015. Genetic structure and morphological differentiation of three western north American dwarf mistletoes (*Arceuthobium*: Viscaceae). Systematic Botany 40(1): 191-207. [Relating to *Archeuthobium cyanocarpum , A. apachecum and A. blumeri*, which parasitise white pines (*Pinus* subgenus *strobus*) in the western USA and northern Mexico. And concluding

from both amplified fragment length polymorphism and morphometric analyses that they are well-differentiated genetically and morphologically, and therefore, should be considered distinct species.]

Ribeiro, D.A., Macêdo, D.G., Oliveira, L.G.S., Saraiva, M.E., Oliveira, S.F., Souza, M.M.A. and Menezes, I.R.A 2014. (Therapeutic potential and use of medicinal plants in an area of the Caatinga in the state of Ceará, northeastern Brazil.) (in Portuguese) Revista Brasileira de Plantas Medicinais 16(4): 912-930. [Among 116 species mentioned for medicinal purposes in this region, *Ximenia americana* picked out as one of the most versatile.]

Robart, B.W., Gladys, C., Frank, T. and Kilpatrick, S. 2015. Phylogeny and biogeography of North American and Asian *Pedicularis* (Orobanchaceae). Systematic Botany 40(1): 229-258. [Nuclear ITS and plastid matK were used to construct a phylogeny incorporating 28 North American and 102 Asian/European species of *Pedicularis*. Probable ancestral areas and dispersal routes were analyzed using the biogeographic program S-DIVA.]

**Rodenburg, J., Cissoko, M., Kayeke, J., Dieng, I., Khan, Z.R., Midega, C.A.O., Onyuka, E.A. and Scholes, J.D 2015. Do NERICA rice cultivars express resistance to *Striga hermonthica* (Del.) Benth. and *Striga asiatica* (L.) Kuntze under field conditions? Field Crops Research 170: 83-94. [For the first time, confirming *Striga*- resistance in the field for NERICA-2, -5, -10 and -17 (against *S. asiatica*) and NERICA-1 to -5, -10, -12, -13 and -17 (against *S. hermonthica*). Despite high *Striga*-infestation levels, yields of 1.8 t ha$^{-1}$ were obtained with NERICA-1, -9 and -10 (in the *S. asiatica*-infested field) and 1.4 t ha$^{-1}$ with NERICA-3, -4, -8, -12 and -13 (in the *S. hermonthica*-infested field). ]**

**Rodenburg, J., Morawetz, J.J. and Bastiaans, L. 2015. *Rhamphicarpa fistulosa*, a widespread facultative hemi-parasitic weed, threatening rice production in Africa. Weed Research (Oxford) 55(2): 118-131. [A valuable general review of the apparently increasing problem of *R. fistulosa* in rice in Africa, involving estimated losses of $150M. Reasons for its spread are not fully understood and although 2,4-D and fertilizer are among possible control measures, the scope for further research on these and a range of other aspects of this problem are discussed in detail.]**

Rodrigues, F.F.G., Camilo, C.J., Galvão-Rodrigues, F.F., Lopes, C.M.U., de Almeida, S.C.X. and da Costa, J.G M. 2015. Chemical profile, total phenols, total flavonoids and antioxidant activity of five species of the Caatinga biome. Journal of Chemical and Pharmaceutical Research 7(2): 309-313. [*Ximenia americana* among plants of the dry forest region of NE Brazil used in traditional medicine. Flavones, flavonols, xanthones, flavononols, steroids and alkaloids identified and extracts of *X. americana* shown to have good antioxidant activities.]

Rosa, A., Nieddu, M., Piras, A., Atzeri, A., Putzu, D. and Rescigno, A. 2015. Maltese mushroom (*Cynomorium coccineum* L.) as source of oil with potential anticancer activity. Nutrients 7(2): 849-864. [*Cynomorium coccineum* is used in traditional medicine and as an emergency food in Mediterranean countries. Oil extracted from dried stems shows potential benefits in cancer prevention, for nutraceutical and pharmaceutical applications.]

Roucel, M. and Grau, F. 2014. The importance of new molecules in selective perfumery. Chemistry & Biodiversity 11(10: 1462-1469. [Including reference to products from *Santalum* spp. Sandranol® or Bacdanol®,]

*Rousseau, C., Hunault, G., Gaillard, S., Bourbeillon, J., Montiel, G., Simier, P., Campion, C., Jacques, M.A., Belin, E. and Boureau, T. 2015. Phenoplant: a web resource for the exploration of large chlorophyll fluorescence image datasets. Plant Metho 11(3 April): 24 pp. [Using this automatic procedure, five chlorophyll fluorescence parameters were found to be impacted by the infection of *Arabidopsis thaliana* by *Phelipanche ramosa*. More generally, this procedure may help to identify chlorophyll fluorescence parameters impacted by various types of stresses.]

*Saha, C., Hegde, P., Friboulet, A., Bayry, J. and Kaveri, S.V. 2015. *Viscum album*-mediated COX-2 inhibition implicates destabilization of COX-2 mRNA. PLoS ONE 10(2) e0114965. (http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0114965)

Sakulnarmrat, K., Srzednicki, G. and Konczak, I. 2015. Bioprospecting Davidson's plum and quandong: cytoprotective and proapoptotic activities. LWT - Food Science and Technology 61(2): 622-629. [Qundong (*Santalum acuminatum*) exhibited cytoprotective activities and reduced the hydrogen peroxide ($H_2O_2$) induced death of hepatocellular carcinoma (HepG2) cells.]

Samba, M., Cheikh, A., Ould-Mohamed-Abdellahi, M.V., Hadou, A., Boumediana, A.I., Kaihil, A., Deida, M.V., Dieng, S., Essassi, E.M. and Minnih, M.S. 2015. Ethnobotanic study, phytochemical screening, antioxidant and antibacterial activities of *Tapinanthus pentagonia*. Journal of Chemical and Pharmaceutical Research 7(4): 1604-1610. [*T. pentagonia*, widespread in Mauritania is used by Mauritanians to relieve conditions such as infertility, jaundice and kidney stones. Activity shown against *Staphylococcus aureus*.]

Sandler, H., Ghantous, K.M. and Gover, A.E. 2014. Current challenges in weed management in northeastern cranberry production. Proceedings of the sixty-eighth Annual Meeting of the Northeastern Weed Science Society, Philadelphia, Pennsylvania, USA, 6-9 January, 2014. Abstracts of papers: 70. [*Cuscuta gronovii* in cranberry was successfully controlled by pronamide until that herbicide ceased to be available. Since then, quinclorac has exhibited good control in trials in Wisconsin but that success has not been duplicated in

Massachusetts. Also, use of quinclorac is currently restricted due to export (residue) issues.]

Sardari, A.A., Jalali, A.A.H., Bahraminejad, S. and Safaee, D. 2015. Effect of plant extracts on the mortality of root-knot nematodes' $J_2$, *Meloidogyne javanica*. Archives of Phytopathology and Plant Protection 48(4): 365-375. [*Rhinanthus minor* among 21 species tested on second stage juvenile ($J_2$) nematodes, but no result in abstract.]

Sardhar and Guggari, A.K. 2015. Management of *Cuscuta* spp. in transplanted onion under irrigated condition. Karnataka Journal of Agricultural Sciences 28(1): 99-101. [Pendimethalin pre-emergence was the best of a range of herbicides for control of unspecified *Cuscuta* in onion.]

Sarıcıcek, B.. and; Aktas, F. 2013. Determination of feed value with using in vitro gas production technique of mistletoes (*Viscum album* L.) silages relating to different hosts. VIth International Balkan Animal Conference, BALNIMALCON 2013, Abstract Book, 3-5 October 2013, Tekirdag, Turkey: 199. [Concluding that silages made from *Viscum album* can be suggested as an alternative forage source for ruminants since they have high levels of nutrients and other suitable qualities.]

Sarmento, J.D.A., de Morais, P.L.D., de Souza, F.I. and de Miranda, M.R.A. 2015. Physical-chemical characteristics and antioxidant potential of seed and pulp of *Ximenia americana* L. from the semiarid region of Brazil. African Journal of Biotechnology 14(20): 1743-1752. [Demonstrating a wide range of useful mineral, nutritional and anti-oxidant components in a range of different extracts from seed and fruit of *X. americana*.]

Sárpataki, O., Páll, E., Sevastre-Berghian, A.C., Stan, R.L., Hanganu, D., Benedec, D., Hangan, A.C., Sevastre, B. and Marcus, I. 2015. Antiproliferative effect of *Viscum album* alcoholic extract *in vitro*. Bulletin of University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca. Veterinary Medicine 72(1): 170-173. [Concluding that *V. album* provides a significant, selective antitumor effect on HeLa tumor cells. In Romania.]

Sateesh Suthari, Sreeramulu, N., Omkar, K.. Reddy, C. and Vatsavaya Raju. 2014. Intracultural cognizance of medicinal plants of Warangal North Forest Division, Northern Telangana, India. Ethnobotany Research and Applications 12: 211-235. [Including the use of *Dendrophthoe falcata* for fever among a total of 257 species listed.]

Schut, M., Rodenburg, J., Klerkx, L., Kayeke, J, van Ast, A. and Bastiaans, L. 2015. RAAIS: Rapid Appraisal of Agricultural Innovation Systems (Part II). Integrated analysis of parasitic weed problems in rice in Tanzania. Agricultural Systems 132: 12-24. [Results of a survey in three sites demonstrate that in Tanzania, weeds in general and parasitic weeds (*Striga* spp. and *Rhamphicarpa fistulosa*) in particular receive little attention in agricultural research, training and education curricula. A range of specific and generic entry points for innovation are identified.]

Scotton, M., Piccinin, L. and Coraiola, M. 2015. Seed production of a subalpine *Festuca nigrescens-Agrostis capillaris* semi-natural grassland in the eastern Italian Alps. Plant Biosystems 149(2): 404-414. [Noting that the seed production of the main grasses *Festuca nigrescens* and *Agrostis capillaries* was affected by the presence of *Rhinanthus freynii*.]

Shafik, M.M., Abdalla, M.M.F. and El-Wahab, M.M.H.A. 2014. Investigations on faba beans, *Vicia faba* L. 34. Selection methods *vs.* original seeds of variety Cairo 4 from healthy and infested plots evaluated under *Orobanche* infestation. Bulletin of Faculty of Agriculture, Cairo University 65(3): 255-264. [Relating to testing of numerous samples of faba bean Cairo 4, known to have tolerance to *O. crenata*.]

Sharawy, S. and Karakish, E. 2015. Taxonomic relationships of some species of *Orobanche* L. evidence from RAPD-PCR and ISSR markers. Pakistan Journal of Botany 47(2): 437-452. [Results confirmed two main groups corresponding to section Trionychon (*O. purpurea*, *O. lavandulacea*, *O. ramosa*, *O. mutelii* and *O. aegyptiaca*) and to section Orobanche (*O. cernua*, *O. crenata*, *O. minor* and *O. pubescens*). High similarity was detected between *O. pubescens* and *O. minor* and between *O. ramosa* and *O. mutelii*..]

Shi, B.X., Chen, G.H., Zhang, Z.J., Hao, J.J., Jing, L., Zhou, H.Y. and Zhao, J. 2015. First report of race composition and distribution of sunflower broomrape, *Orobanche cumana*, in China. Plant Disease 99(2): 291-292. [Races A, D, E and G were the main race types of *O. cumana* in China. Race D was the predominant type and had the widest distribution. Race G was the highest level race type in this study, but was mainly limited to the western part of Inner Mongolia.]

Shin KyungHa and 9 others. 2015. Effectiveness of the combinational treatment of *Laminaria japonica* and *Cistanche tubulosa* extracts in hair growth. Laboratory Animal Research 31(1): 24-32. [Results suggest that combinational oral treatment with *C. tubulosa* with *L. japonica* can prevent hair loss and improve alopecia, perhaps mediated by their anti-inflammatory activities.]

Shobit Gupta, Abhishek Singh, Pooja Chaudhary, Mukeshwar Pandey, Singh, K.M. and Chikara, S.K. 2014. Identification of soil enriched microorganisms using 16S rDNA analysis for crop productivity. Current Trends in Biotechnology and Pharmacy 8(4): 350-358. [Identifying potentially cultivable endophytic bacteria in soils below *Santalum album* in India.]

Silpa, S., Jamal Uddin and Sekhar, V.L.J. 2014. Screening of *Taxillus tomentosus* ethanolic extract for nootropic and antistress activity in rats. International Journal of Innovation and Applied Studies 8(4): 1533-1544. [Results show significant neuro-protection, memory enhancement activity of *T. tomentosus* extracts which could be useful as supportive adjuvant in treatment of stress and stress related disorders.]

Siuli Batabyal, Tinkari Dalal and Jagatpati Tah. 2014. Responses of some phyto-hormones for vegetative propagation of an ancient precious wood plant:

*Santalum album* L. Bioscience Discovery 5(2): 170-174. [Results not clear, but interesting comment that 'So far, the only means of propagation is through *endozoochory*, the natural propagation through bird's droppings.]

***Skippington, E., Barkman, T.J., Rice, D.W. and Palmer, J.D. 2015. Miniaturized mitogenome of the parasitic plant *Viscum scurruloideum* is extremely divergent and dynamic and has lost all *nad* genes. Proceedings of the National Academy of Science. (http://www.pnas.org/content/early/2015/06/18/1504491112.abstract) [Papers presented at the recent congress in Kunming, China (see above) stunningly displayed the value of genomic studies into the evolution and function of parasitic plants. Here is another remarkable example. This paper, from the laboratory of Jeff Palmer at Indiana University where many landmark studies on parasites have been conducted (sequence of *Epifagus virginiana*, discovery of parasite genes in the basal angiosperm *Amborella*, and more) reports what the authors rightly term 'the wonderfully bizarre mitogenome of the hemiparasitic aerial mistletoe *Viscum scurruloideum*.' This mistletoe was collected in Borneo in the Malaysian state of Sabah and the genome of the mitochondrion sequenced revealing unprecedented reduction in respiratory genes, making it the smallest known mitogenome of any land plant! The authors cautiously link this reduction with the parasitic behavior of the plant while at the same time pointing out a dramatic increase in synonymous substitution rates. The related mistletoe genus *Arceuthobium* has been studied by Dan Nickrent and his students, who reported genomic reductions as part of a shift to holoparasitism but the present report is the first of its kind for this genus.]**

Soberón, J.R., Sgariglia, M.A., Dip Maderuelo, M.R., Andina, M.L., Sampietro, D.A. and Vattuone, M.A. 2014. Antibacterial activities of *Ligaria cuneifolia* and *Jodina rhombifolia* leaf extracts against phytopathogenic and clinical bacteria. Journal of Bioscience and Bioengineering 118(5): 599-605. [*L. cuneifolia* (Loranthaceae) showed inhibitory activities against phytopathogenic bacteria *Pseudomonas syringae*, clinical strains of *Escherichia coli* and *Staphylococcus aureus*. *J. rhombifolia* (Santalaceae) was active only on *Pseudomonas syringae*.]

Solanki, N.S., Chauhan, C.S., Vyas, B. and Marothia, D. 2015. *Santalum album* Linn: a review. International Journal of PharmTech Research 7(4): 629-640. [A wide-ranging review of the distribution, agronomy and phytochemistry of *S. album* and of its uses in perfumery and traditional medicine including its use in cystitis, gonorrhea, skin care, *Helicobacter pylori*-induced ulcer, bladder infections, etc.]

Sonia, M.D., Robinson, P.J. and Rajasekaran, A.S. 2015. Mining efficient fuzzy bio-statistical rules for association of Sandalwood in Pachaimalai hills. In: Andreopoulou, Z.S. and Arabatzis, G. (eds) International Journal of Agricultural and Environmental Information Systems (IJAEIS) 6(2): 40-76. [Including an item on 'the mining of efficient fuzzy bio-statistical rules for plant associations around sandalwood (*Santalum album*)' in Tamil Nadu.]

Sönmez, T. 2014. (Effect of mistletoe on growth of Scotch pine (*Pinus silvestris* L.).) (in Turkish) Artvin Çoruh Üniversitesi Orman Fakültesi Dergisi 15(1): 64-72. [Results suggest that *Viscum album* reduced the annual diameter increment of *P. sylvestris* by 40% within 10 years, the height growth by 47% and the double bark thickness by about 25%. (Or was the *V. album* associated with weaker trees? Ed.]

Souza, R.K.D., da Silva, M.A.P., de Menezes, I.R.A., Ribeiro, D.A., Bezerra, L.R. and Souza, M.M.deA. 2014. Ethnopharmacology of medicinal plants of carrasco, northeastern Brazil. Journal of Ethnopharmacology 157: 99-104. [*Ximenia americana* among the species warranting more in-depth study, on the basis of versatility and informant consensus on the uses of the species.]

Stachnowicz, W. 2013. *Melampyrum cristatum* L. - a rare river corridor plant in Wielkopolska and Poland. Biodiversity: Research and Conservation 32: 29-44. [Describing the distribution of *C. cristatum* in Poland, once thought extinct but now found at sites along the Warta river. Its scarcity may be connected to the changeable water regime in floodplains, as well as potential limitations of myrmecochoric seed dispersal.]

*Steele, M.L., Axtner, J., Happe, A., Kröz, M., Matthes, H. and Schad, F. 2014. Adverse drug reactions and expected effects to therapy with subcutaneous mistletoe extracts (*Viscum album* L.) in cancer patients. Evidence-based Complementary and Alternative Medicine, 2014: Article ID 724258. (http://www.hindawi.com/journals/ecam/2014/724258/) [A study of 1923 cancer patients treated with subcutaneous *V. album* extracts indicated no serious adverse reaction.]

*Steele, M.L., Axtner, J., Happe, A., Kröz, M., Matthes, H. and Schad, F. 2014. Safety of intravenous application of mistletoe (*Viscum album* L.) preparations in oncology: an observational study. Evidence-based Complementary and Alternative Medicine 2014: Article ID 236310. (http://www.hindawi.com/journals/ecam/2014/236310/) [A study based on 475 patients suggested that intravenous injections of *V. album* preparations (Abnoba, Helixor and Iscucin) caused less adverse reactions than the recommended sub-cutaneous injections.]

Steele, M.L., Axtner, J., Happe, A., Kröz, M., Matthes, H. and Schad, F. 2015. Use and safety of intratumoral application of European mistletoe (*Viscum album* L) preparations in oncology. Integrative Cancer Therapies 14(2): 140-148. [In a survey of the results of 862 injections in 123 patients over 6 years with *V. album* preparations. Virtually no serious adverse reactions were recorded. There were more mild to moderate

reactions than previously reported but further studies are warranted with suitable caution.]

Su, H.-J., Hu, J.-M., Anderson, F.E. and Nickrent D.L. 2015. Phylogenetic relationships of Santalales with insights into the origins of holoparasitic Balanophoraceae. Taxon 64(3): 491-506. [A seven gene by 197 taxon matrix was analyzed to examine relationships within Santalales, particularly the position of Balanophoraceae. The latter was shown to be composed of two clades here referred to as Balanophoraceae s. str. and Mystropetalaceae (*Dactylanthus*, *Hachettea*, and *Mystropetalon*).]

Su XiaoJuan, Liu GuangDa, Liu Ying, Feng XiaoYu and Chen GuiLin. 205. (Mitochondrial gene intron sequences analysis of medicinal parasitic plant *Cynomorium songaricum*.) (in Chinese) Genomics and Applied Biology 34(2): 373-381. [*Cox1* gene group I introns in angiosperm always have the phenomenon of horizontal gene transfer (HGT). The sequences of mitochondrial *cox1*, *cox2* and *nad1* genes in medicinal parasitic plant *C. songaricum* was amplified and analyzed. The phylogeny of *cox1* gene intron results did not match another three, which suggested the intron may have horizontal gene transfer (HGT) phenomenon. The result suggested the intron of *cox1* gene may have function, and most likely codes endonuclease, which can promote the intron to transfer.]

Sui Yi and Zhang Ling. 2014. (A preliminary investigation on the spatial distribution patterns of mistletoes in polyculture and monoculture plantations in Xishuangbanna, Southwest China.) (in Chinese) Journal of Yunnan University - Natural Sciences Edition 36(5): 755-764. [Studies of the spatial structures of different mistletoe species (not specified) in stands of various diversity suggest that increasing the diversity of the hosts in the plantation may be a good way to reduce mistletoe infection prevalence, and to increase the productivity and efficiency.]

Sunitha, S.N. 2014. Regenerative effect of L-ascorbic acid on the *in vitro* grown plants. British Biotechnology Journal 4(12): 1238-1252. [*Santalum album* included in studies indicating that L-ascorbic acid could be used as a general growth enhancer and in the regeneration of whole plants.]

Sweta Bhan, Lalit Mohan and Srivastava, C.N. 2015. Combinatorial studies on thermosensitization of nanoencapsulated temephos and *Cuscuta reflexa*. International Journal of Pharmaceutical Research and Bio-Science 4(1): 20-35. [A nano-formulation based on the larvicide temephos and *C. reflexa* was tested on larvae of *Anopheles stephensi* and *Culex quinquefasciatus* at a range of temperatures and was found efficient against both species at $20^0$C.]

Sweta Bhan, Lalit Mohan and Srivastava, C.N. 2015. Photosensitization of nanoencapsulated temephos and *Cuscuta reflexa* combination on mosquito larvae. International Journal of Pharmaceutical Research and Bio-Science, 4(1): 94-110. [Showing that activity of nano-encapsulated temephos/*C. reflexa* on larvae of *Anopheles stephensi* and *Culex quinquefasciatus* is greater under fluorescent or UV light than in darkness.]

Syed Saeed-ul-Hassan, Shahid Rasool, Muhammad Khalil-ur-Rehman, Saiqa Ishtiaq, Shahid-ul-Hassan and Imran Waheed and Saeed, M.A. 2014. Phytochemical investigation of irritant constituents of *Cuscuta reflexa*. International Journal of Agriculture and Biology 16(6): 1194-1198. [*C. reflexa* can cause skin irritation. This study isolated a number of components which were confirmed to cause irritation to rabbit skin.]

Tájek, P. 2014. (Flora and vegetation of Horňáčkova louka (Slavkovský les Protected Landscape Area, Czech Republic).) (in Czech) Erica (Plzeň) 21: 3-37. [*Pedicularis sylvatica* subsp. *sylvatica* among the more important species recorded.]

Taneda, H., Watanabe-Taneda, A., Chhetry, R. and Ikeda, H. 2015. A theoretical approach to the relationship between wettability and surface microstructures of epidermal cells and structured cuticles of flower petals. Annals of Botany 115(6): 923-937. [A study in Japan involving at least one species of *Pedicularis*.]

Tapsya Gautam, Gautam, S.P., Keservani, R.K. and Sharma, A.K. 2015. Phytochemical screening and wound healing potential of *Cuscuta reflexa*. Journal of Chinese Pharmaceutical Sciences 24(5): 292-302. [Confirming that water and ethanolic extracts from *C. reflexa* had therapeutic potential to heal wounds, supporting its use in folk medicine in India.]

Teixeira-Costa, L. and Ceccantini, G. 2015. Embolism increase and anatomical modifications caused by a parasitic plant: *Phoradendron crassifolium* (Santalaceae) on *Tapirira guianensis* (Anacardiaceae). IAWA Journal 36(2): 138-151. [Showing that *T. guianensis* wood expressed a higher density of embolized vessels, narrower vessel lumen diameter, higher vessel density, taller and wider rays, and fibres with thinner cell walls, mainly in the downstream sections of the parasitized branches. Apparently induced by a combination of water stress, unbalanced auxin/cytokinin concentrations due to phloem disruptions caused by the parasite's penetration and action; and by higher than usual ethylene levels.]

Teka, H.B. 2014. Advance research on *Striga* control: a review. African Journal of Plant Science 8(11): 492-506. [A general review advocating the use of integrated control techniques.]

Teklay Abebe, Yemane Nega, Muez Mehari, Adhiena Mesele, Assefa Workineh and Hadas Beyene. 2015. Genotype by environment interaction of some faba bean genotypes under diverse broomrape environments of Tigray, Ethiopia. Journal of Plant Breeding and Crop Science 7(3): 79-86. [Six faba bean genotypes were tested across six environments for resistance to *Orobanche crenata*. Line ILB4358 gave highest consistent yield (approximately double that of the susceptible check) and lower *O. crenata* numbers followed by line Sel.F5/3382/2003-4.]

Těšitel, J.. Těšitelová, T., Fisher, J.P., Lepš, J. and Cameron, D.D. 2015. Integrating ecology and

physiology of root-hemiparasitic interaction: interactive effects of abiotic resources shape the interplay between parasitism and autotrophy. New Phytologist 205(1): 350-360. [Showing that mineral nutrition and water supply had complex effects on the relative performance of *Rhinanthus alectorolophus* and its maize or wheat hosts. The effects of the parasite on the hosts were least when nutrient and water supply were both either high or low. Conversely the growth of the parasite was greater when either water or nutrient were limiting – being greatest at high nutrition and low water supply.]

Teves, M.R., Wendel, G.H. and Pelzer, L.E. 2015. Reduction in voluntary ethanol intake following repeated oral administration of *Jodina rhombifolia* lyophilized aqueous extract in male Wistar rats. Journal of Ethnopharmacology 161: 170-174. [The leaves of *J. rhombifolia* (Santalaceae) are utilized in Argentine folk medicine for the treatment of alcoholism. Repeated administration of an extract of *J. rhombifolia* reduced voluntary ethanol intake in male Wistar rats to a 'remarkable' extent.]

Togola, A., Karabinta, K., Dénou, A., Haidara, M., Sanogo, R. and Diallo, E.D. 2014. (Protective effect of leaves of *Opilia celtidifolia* against ethanol-induced ulcer in rats.) (in French) International Journal of Biological and Chemical Sciences 8(6): 2416-2423. [*O. celtidifolia* is a plant traditionally used against wounds and gastro-duodenal ulcer in Mali. Results confirm that leaves of *O. celtidifolia* may be useful in the treatment of gastric ulcer.]

Togor, G.C. and Burescu, P. 2013. Species-rich *Nardus* grasslands from the northern part of the Bihor Mountains. Studia Universitatis Vasile Goldis Arad, Seria Stiintele Vietii, 2013, 23, 4, 505-512. [Including reference to the 'vulnerable species' *Pedicularis limnogena*. (In Romania).]

Tokunaga, T., Hayashi, H. and Akiyama, K. 2015. Medicaol, a strigolactone identified as a putative didehydro-orobanchol isomer, from *Medicago truncatula*. Phytochemistry 111: 91-97. [A major strigolactone produced by the model legume *M. truncatula* (barrel medic) has been tentatively identified as a didehydro-orobanchol isomer. In this study, a putative didehydro-orobanchol isomer was isolated from root exudates collected from *M. trunculata* grown hydroponically under phosphate-starved conditions. The structure and absolute configurations of this strigolactone, named medicaol, were determined. Plausible biosynthetic pathways from 4-deoxyorobanchol to medicaol are also proposed.]

Trabelsi, I., Abbes, Z., Amri, M. and Kharrat, M. 2015. Performance of faba bean genotypes with *Orobanche foetida* Poir. and *Orobanche crenata* Forsk. infestation in Tunisia. Chilean Journal of Agricultural Research 75(1): 27-34. [Seven new small-seeded faba bean genotypes showed moderate to high resistance to both *O. foetida* and *O. crenata* in field trials, better than released 'resistant' varieties Baraca and Najeh. Yield loss to *O. foetida* was 92% in susceptible variety, 60% in Baraca and only 14% in the best of the new lines.]

*Tröger, W., Ždrale, Z., Tišma, N. and Matijaševic´, M. 2014. Additional therapy with a mistletoe product during adjuvant chemotherapy of breast cancer patients improves quality of life: an open randomized clinical pilot trial. Evidence-based Complementary and Alternative Medicine 2014: Article ID 430518. (http://www.hindawi.com/journals/ecam/2014/430518/) [A study on 95 patients showed a distinct improvement of quality of life by treating breast cancer patients with the *Viscum album*- based Helixor A in conjunction with chemotherapy.]

Ueno, K. Furumoto, T., Umeda, S., Mizutani, M., Takikawa, H., Batchvarova, R. and Sugimoto, Y. 2014. Heliolactone, a non-sesquiterpene lactone germination stimulant for root parasitic weeds from sunflower. Phytochemistry 108: 122-128. [Identifying heliolactone, a carlactone-type molecule exuded by sunflower line 2607A, which induces germination of *Striga hermonthica*, *Orobanche cumana*, *O. minor*, *O. crenata*, and *Phelipanche aegyptiaca* while the related dehydrocostus lactone and costunolide also from sunflower root exudates, were effective only on *O. cumana* and *O. minor*. Heliolactone exudation was reduced by N and P, whereas costunolide exudation was increased with higher fertility.]

Van Andel, T.R., Croft, S., van Loon, E.E., Quiroz, D., Towns, A.M. and Raes, N. 2015. Prioritizing West African medicinal plants for conservation and sustainable extraction studies based on market surveys and species distribution models. Biological Conservation 181: 173-181. [Recommending IUCN threat status for four forest species not previously assessed including *Okoubaka aubrevillei* (Santalaceae), which has narrow distribution in West Africa and is extensively commercialized.]

Vennila, V. and Anitha, R. 2015. *In vitro* evaluation of anti-arthritic activity in different solvent extracts from *Cuscuta reflexa*. World Journal of Pharmacy and Pharmaceutical Sciences (WJPPS) 4(4): 1340-1350. [*C. reflexa* is used for the treatment of arthritis in folklore medicine in India. Results of this study confirmed marked *in vitro* anti-arthritic activity against the denaturation of protein.]

Vinay Ranjan and Anant Kumar. 2014. *Scurrula gracilifolia* (Loranthaceae): a new distributional record from Gorumara National Park, West Bengal. Indian Journal of Forestry 37(4): 429-430. [No host mentioned.]

Vishal Vijayan and Rahees, N. 2015. Seed germination of sandal (*Santalum album* Linn.): influence of light quality and seed scarification. Lifesciences Leaflets 59: 90-9. [Good germination of *S. album* obtained with GA plus full white light. Very little germination under red or blue light.]

Vogan, P.J. and Schoettle, A.W. 2015. Selection for resistance to white pine blister rust affects the abiotic stress tolerances of limber pine. Forest Ecology and

Management 344: 110-119. [Incidentally noting *Arceuthobium cyanocarpum* among factors causing increasing mortality of *Pinus flexilis* in Colorado, USA.]

Von Schoen-Angerer, T., Goyert, A., Vagedes, J., Kiene, H., Merckens, H. and Kienle, G.S. 2014. Disappearance of an advanced Adenomatous colon polyp after intratumoural injection with *Viscum album* (European mistletoe) extract: a case report. Journal of Gastrointestinal and Liver Diseases 23(4): 449-452.

Wahid, H.A., Barozai, M.Y.K. and Muhammad Din. 2015. Dwarf mistletoe (*Arceuthobium oxycedri*) and damage caused by dwarf mistletoe to family Cupressaceae. Pure and Applied Biology 4(1): 15-23. [A general review on *Arceuthobium* spp. with particular emphasis on *A. oxycedri* and its hosts in Cupressaceae.]

Wakabayashi, T., Joseph B,, Yasumoto S,, Akashi T., Aoki T., Harada K., Muranaka S., Bamba T., Fukusaki E., Takeuchi Y., Yoneyama K., Muranaka T., Sugimoto Y., Okazawa A. 2015. Planteose as a storage carbohydrate required for early stage of germination of *Orobanche minor* and its metabolism as a possible target for selective control. Journal of Experimental Botany 66(11): 3085-3097. [A galactosyl-sucrose trisaccharide, planteose (α-d-galactopyranosyl-(1→6)-β-d-fructofuranosyl-(2→1)-α-d-glucopyranoside), was identified in *O. minor* as a metabolite that decreased promptly after reception of the germination stimulant. Among several glycosidase inhibitors examined, nojirimycin bisulfite (NJ) was found to alter the sugar metabolism and to selectively inhibit the germination of *O. minor*. These results suggest that planteose is a storage carbohydrate required for early stage of germination of *O. minor*, and NJ inhibits germination by blocking the supply of essential glucose from planteose and sucrose. Additionally, NJ selectively inhibited radicle elongation of germinated seeds of *Striga hermonthica* and *Phtheirospermum japonicum*. Thus, NJ will be a promising tool to develop specific herbicides for the parasites, especially broomrapes.]

Walter, M.H., Stauder, R. and Tissier, A. 2015. Evolution of root-specific carotenoid precursor pathways for apocarotenoid signal biogenesis. Plant Science 233:1-10. [This review describes root-specific isogene components of carotenoid pathways toward apocarotenoid formation, highlighting a new *PSY3* class of phytoene synthase genes in dicots, clearly distinct from the monocot *PSY3* class co-regulated with ABA formation. At least two members of the exclusive dicot *PSY3s* are regulated by nutrient stress and mycorrhization. This newly recognized dicot *PSY3* (*dPSY3* vs. *mPSY3* from monocots) class probably represents an ancestral branch in the evolution of the plant phytoene synthase family. Stress-inducible isoforms for rate-limiting steps in root carotenogenesis might be components of multi-enzyme complexes committed to apocarotenoid rather than to carotenoid formation.]

Wang ChunYang, Liu Yang, Li SiShen and Han GuanZhu. 2015. Insights into the origin and evolution of the plant hormone signaling machinery. Plant Physiology 167(3): 872-886. [Use of comparative genomic and phylogenetic approaches suggest that strigolactone signaling pathways originated in charophyte lineages along with those for auxin and cytokinin.]

Wang FengXia, Wang Wei, Huang YuLong, Liu ZhongWang and Zhang Ji. 2015. Characterization of a novel polysaccharide purified from a herb of *Cynomorium songaricum* Rupr. Food Hydrocolloids 47: 79-86.

Wang LinLin, Ding Hui, Yu HeShui, Han LiFeng, Lai QingHai, Zhang LiJuan and Song XinBo. 2015. Cistanches Herba: chemical constituents and pharmacological effects. Chinese Herbal Medicines 7(2): 135-142. [A general review of the pharmacological uses of *Cistanche deserticola* and *C. tubulosa*, including kidney-deficiency-induced diseases such as infertility, forgetfulness, hearing lost, chronic constipation, etc. ; also antioxidant, estrogenic, anti-osteoporotic, and anti-inflammation effects.]

Wang LiSong, Jia Yu, Zhang XianChun, Qin HaiNing. 2015. (Overview of higher plant diversity in China.) (in Chinese) Biodiversity Science 23(2): 217-224. [Including some impressive statistics – the Chinese flora includes over 35,000 spp. of higher plants (over 17,000 endemic) and noting that the top ten genera include *Pedicularis* with 363 species, 283 of which are endemic.]

Wang YuJie, Zhou SiMin, Xu Gang and Gao YuQi. 2015. Interference of phenylethanoid glycosides from *Cistanche tubulosa* with the MTT assay. Molecules 20(5): 8060-8071. [Concluding that the caffeyl group present in echinacoside and acteoside, the two main phenylethanoid glycosides from *C. tubulosa*, is responsible for interfering with results of the MTT assay for EA.hy926 cell viability.]

Webb, G., Mayer, R. and Thomson, R. 2014. Control of meat ants (*Iridomyrmex sanguineus* Forel) in a Western Australian sandalwood plantation using bait technology. General and Applied Entomology 42: 43-49. [Addition of fish oil to Distance® Ant Bait (pyriproxyfen) appeared to enhance bait preference, but there was no evident value in terms of reducing overall mound activity in *Santalum* sp. not defined, but probably *S. spicatum*.]

*Weon JinBae, Lee JiWoo, Eom MinRye, Jung YounSik and Ma ChoongJe. 2014. The effects of *Loranthus parasiticus* on scopolamine-induced memory impairment in mice. Evidence-based Complementary and Alternative Medicine 2014: Article ID 860180. (http://www.hindawi.com/journals/ecam/2014/860180/) [Confirming memory enhancing and neuroprotective effects of *L. parasiticus* (=*Scurrula parasitica* ) which may be related to inhibition of AChE activity, ROS level, and $Ca^{2+}$ influx. *L. parasiticus* is used traditionally in Korea for cholesterol lowing, diuretic action, antibacterial effect, and antivirus effect.]

Wong HoiShan, Chen JiHang, Leong PouKuan, Leung HoiYan, Chan WingMan and Ko KamMing. 2014. β-Sitosterol protects against carbon tetrachloride

hepatotoxicity but not gentamicin nephrotoxicity in rats via the induction of mitochondrial glutathione redox cycling. Molecules 19(11): 17649-17662. [β-Sitosterol is an active component of herbal remedies based on *Cistanche deserticola* and/or *C. tubulosa*.]

Wu JianGuo, Wang YanYan, Zhang ZiLv and Yu Bin. 2015. Herbal medicine in the treatment of Alzheimer's disease. Chinese Journal of Integrative Medicine 21(2): 102-107. [A review including reference to *Cuscuta chinensis*.]

Xie XiaoYu, Wei Fen, Chen Liang and Wang SiCen 2015. Preparation of molecularly imprinted polymers based on magnetic nanoparticles for the selective extraction of protocatechuic acid from plant extracts. Journal of Separation Science 38(6): 1046-1052. [The materials prepared were used as the solid-phase extraction materials coupled to high-performance liquid chromatography for the selective extraction and detection of protocatechuic acid from the extracts of *Cynomorium songaricum*.]

*Xu SongZhi, Li DeZhu, Li JianWu, Xiang XiaoGuo, Jin WeiTao, Huang WeiChang, Jin XiaoHua and Huang LuQi. 2015. Evaluation of the DNA barcodes in *Dendrobium* (Orchidaceae) from mainland Asia. PLoS ONE 10(1) e0115168 (http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0115168) [ITS+*matK* was the optimal barcode for *Dendrobium* spp.; also for *Pedicularis* spp.]

Yau, T., Dan XiuLi, Ng CheukWing and Ng TziBun. 2015. Lectins with potential for anti-cancer therapy. Molecules 20(3): 3791-3810. [A review covering lectins from *Viscum album*.]

**Yang, Z.Z., Wafula, E.K., Honaas, L.A., Zhang, H.T., Das, M., Fernandez-Aparicio, M., Huang, K., Bandaranayake, P.C.G., Wu, B., Der, J.P., Clarke, C.R., Ralph, P.E., Landherr, L., Altman, N.S., Timko, M.P., Yoder, J.I., Westwood, J.H., de Pamphilis, C.W. 2015. Comparative transcriptome analyses reveal core parasitism genes and suggest gene duplication and repurposing as sources of structural novelty. Molecular Biology and Evolution 32(3): 767-790. [This is another important paper from the Parasitic Plant Genome Project that has contributed much to our understanding of these fascinating plants. Gene duplication is suggested as one of the pathways for a plant to move from being an autotrophic plant to a parasitic one. They found that about 180 genes are upregulated during haustorial development and that an additional 100 shared genes are upregulated in response to factors that induce haustorial development. The authors have coined the term 'parasitism genes' for these genes that enrich proteaeses and modify cell walls—functions needed for penetration and parasitism of a host.]**

Yaacoby, T., Goldwasser, Y., Paporish, A. and Rubin, B. 2015. Germination of *Phelipanche aegyptiaca* and *Cuscuta campestris* seeds in composted farm manure. Crop Protection 72: 76-82. [A temperature of $55^0$C in compost or the lab for 5-6 hours was enough to kill all *P. aegyptiaca* seeds but some *C. campestris* seeds survived $60^0$C for at least 28 days.]

Yasunaga, T., Yamada, K. and Artchawakom, T. 2015. First Indochinese records of the plant bug genus *Hypseloecus* Reuter (Hemiptera: Heteroptera: Miridae: Phylinae: Pilophorini), with descriptions of eight new species from Thailand. Zootaxa 3925(1): 75-93. [Eight new species of *Hypseloecus* are described, 4 of which being associated with inflorescence and/or fruits of Loranthaceae, particularly *Scurrula* spp. in Thailand. These are additional to those reported by Yeshwant, 2014 – see below.]

Yeshwant, H.M. 204. Five new species of *Hypseloecus* Reuter (Hemiptera: Miridae) on hemiparasitic Santalales from India., Zootaxa 3878(1): 75-88. [The genus is recorded for the first time from India, collected on *Dendrophthoe* and *Viscum* species.]

Yohannes, T., Abraha, T., Kiambi, D., Folkertsma, R., Hash, C.T., Ngugi, K., Mutitu, E., Abraha, N., Weldetsion, M., Mugoya, C., Masiga, C.W. and de Villiers, S. 2015. Marker-assisted introgression improves *Striga* resistance in an Eritrean Farmer-Preferred Sorghum Variety. Field Crops Research 173: 22-29. [Using marker-assisted selection in the transfer of 5 *Striga*-resistance Quantitative Trait Loci (QTLs) from the resistant donor N13 to the local *Striga* susceptible farmer-preferred sorghum variety Hugurtay. Lines L2P3-B, L1P5-A and L2P5P35 were less resistant than N-13 but had 40% less *S. hermonthica* and yielded double that of Hugurtay.]

**Yoneyama, K., Arakawa, R., Ishimoto, K., Kim HyunIl, Kisugi, T. Xie XiaoNan, Nomura, T., Kanampiu, F., Yokota, T., Ezawa, T. and Yoneyama, K. 2015. Difference in *Striga*-susceptibility is reflected in strigolactone secretion profile, but not in compatibility and host preference in arbuscular mycorrhizal symbiosis in two maize cultivars. New Phytologist 206(3): 983-989. [*Striga*-susceptible (Pioneer 3253) exuded 5-deoxystrigol exclusively while the resistant (KST 94) exuded mainly sorgomol. Regardless of this striking difference there were no differences in the level or composition of mycorrhizal infection. This is encouraging in that selection for low *Striga*-stimulating strigolactone may not necessarily interfere with normal mycorrhizal symbiosis.]**

Yoneyama, K., Kisugi, T., Xie, X., Arakawa, R., Ezawa, T., Nomura, T. and Yoneyama, K. 2015. Shoot-derived signals other than auxin are involved in systemic regulation of strigolactone production in roots. Planta 241(3): 687-698. [N and P applied to one side in a split-root system reduced strigolactone content (sorgomol and 5-deoxystrigol) of both parts of the sorghum root system. The results of applying auxin (IAA) to the shoots suggest that shoot-derived signals other than auxin are involved in the regulation of strigolactone production in roots.]

Yong, JWH, Wei, JW, Khew, JYT, Rong, SC, and San, WW. 2015. A guide to the common epiphytes and mistletoes of Singapore. CENGAGE Learning (Center for Urban Greenery and Ecology). 276 pp. [This book takes a functional approach to classifying the aerial parasites of Singapore, as epiphytes, climbers, and mistletoes. Good descriptions, host ranges, and photographs are provided for the eight mistletoes (6 Loranthaceae, 2 Viscacaceae) known from the city-state.]

Yu Jiang, Zeng BangGuo and Xiao LongXiang. 2014. (Determination of verbascoside, luteolin and apigenin in *Siphonostegia chinensis* by HPLC.) (in Chinese) Chongqing Medicine 43(23): 23, 3040-3041.

Yu WenBin, Wang Hong, Ren YongQuan and Li DeZhu 2015. Typification of seven Chinese species of *Pedicularis* (Orobanchaceae) described by Bureau and Franchet with taxonomic notes. Plant Ecology and Evolution 148(1): 144-148. [Recording lectotypes of *P. batangensis*, *P. birostris*, *P. goniantha*, *P. microphyton*, *P. princeps*, *P. rhynchodonta* and *P. tatsienensis*.]

Zekry, S.H., Abo-elmatty, D.M., Zayed, R.A., Radwan, M.M., ElSohly, M.A., Hassanean, H.A. and Ahmed, S.A. 2015. Effect of metabolites isolated from *Cuscuta pedicellata* on high fat diet-fed rats. Medicinal Chemistry Research 24(5): 1964-1973. [Confirming the anti-obesity effect of *C. pedicellata* reported by the Egyptian population and identifying the main compounds responsible for this activity, including naringenin.].

Zarafi, A.B., Elzein, A., Abdulkadir, D.I., Beed, F. and Akinola, O.M. 2014. Host range studies of *Fusarium oxysporum* f.sp. *strigae* meant for the biological control of *Striga hermonthica* on maize and sorghum. Archives of Phytopathology and Plant Protection 48(1): 1, 1-9. [Isolates of *Fusarium oxysporum* f.sp. *strigae* PSM197 and FOXY2s which have been reported effective against *S. hermonthica* were screened for safety on 26 Nigerian crop species and a number of them showed growth reduction and/or infection, suggesting the need for further study.]

*Zhang DaLe, Qi JinFeng, Yue JiPei, Huang JinLing, Sun Ting, Li SuoPing, Wen JianFan, Hettenhausen, C., Wu JinSong, Wang Lei, Zhuang HuiFu, Wu JianQiang and Sun GuiLing. 2014. Root parasitic plant *Orobanche aegyptiaca* and shoot parasitic plant *Cuscuta australis* obtained Brassicaceae-specific *strictosidine synthase-like* genes by horizontal gene transfer. BMC Plant Biology 14(19)(13 January 2014) (http://www.biomedcentral.com/content/pdf/1471-2229-14-19.pdf) [Transcriptome screening revealed that a strictosidine synthase-like (SSL) gene in the root parasitic plant *O.aegyptiaca* and the shoot parasitic plant *C. australis* showed much higher sequence similarities with those in Brassicaceae than with those in their close relatives, suggesting independent gene horizontal transfer events from Brassicaceae to these parasites.]

*Zhang Ke and 12 others. 2014. Extracts of *Cistanche deserticola* can antagonize immunosenescence and extend life span in senescence-accelerated mouse prone 8 (SAM-P8) mice. Evidence-based Complementary and Alternative Medicine, 2014, 2014, Article ID 601383. (http://www.hindawi.com/journals/ecam/2014/601383/) [Results support long standing clinical observational studies showing that *C. deserticola* has significant effects in extending life span and suggest this is achieved by antagonizing immunosenescence.]

Zhou ShengLiang, Yan ShuZhen, Liu QiSha and Chen ShuangLin. 2015. Diversity of endophytic fungi associated with the foliar tissue of a hemi-parasitic plant *Macrosolen cochinchinensis*. Current Microbiology 70(1): 58-66. [Identifying 51 taxa of endophytic fungi in the leaves of *M. cochinchinensis*, the most abundant being *Valsa* spp. and including a *Tremella* spp., perhaps for the first time as an endophyte.]

Zitta, C., Magani, E.I. and Ahom, R.I. 2014. Effects of varying levels of *Parkia biglobosa* pulp for the control of *Striga genesnerioides* (WILD) in cowpea *Vigna unguiculata* (L) WALP. Journal of Biopesticides 7(2): 137-143. [Application of 2, 3 and 4 g/hill of *Parkia* pulp before planting significantly reduced the number of cowpea plants infested with *S. gesnerioides* and reduced *Striga* shoot count and seed production. Crop yields were not significantly increased but crop vigour was improved. See also Itta, C.Z. *et al.* above for similar results a year later? Itta/Zitta related?)]

Zuria, I., Castellanos, I. and Gates, J.E. 2014. The influence of mistletoes on birds in an agricultural landscape of central Mexico. Acta Oecologica 61: 51-56. [Thirty-one percent of the trees surveyed (mainly *Prosopis laevigata*) were infected by *Psittacanthus calyculatus*. There was a significant association between bird species richness and bird abundance with number of *P. calyculatus* confirming that mistletoes can be important in promoting a higher bird species richness and abundance in tropical agricultural landscapes.]

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