HAUSTORIUM

Parasitic Plants Newsletter
ISSN 1944-6969
Official Organ of the International Parasitic Plant Society
(http://www.parasiticplants.org/)

December 2017 **Number 72**

CONTENTS

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MESSAGE FROM THE PRESIDENT

Dear IPPS members,

I would like to wish everyone a very happy New Year!

In November this year the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in collaboration with the Biosciences eastern and central Africa – International Livestock Research Institute (BecA-ILRI) Hub, organized a two-day *Striga* workshop on ‘Renewed Strategies for *Striga* Management’. The workshop brought together ideas from stakeholders and experts in different areas of *Striga* management and research to discuss the current status of *Striga* control, the impact of available technologies and new developments in *Striga* research worldwide with the aim of improving *Striga* control. The meeting was extremely interesting and one outcome was the idea to form an ‘Alliance for *Striga* Control in Africa’ that would define and make recommendations for *Striga* research investment that would hopefully result in improved strategies for control of *Striga* in the near future. For an overview of this meeting please see the article written by Jerome Bossuet from ICRISAT India (http://news.trust.org/item/20171208092958-qfxpo/) (see also below under Press Reports)

Next year looks like a very busy year for meetings involving parasitic plants! There are already four conferences with likely sessions on parasitic weeds: the 28th German Conference on Weed Biology and Weed Control in March in Braunschweig, Germany, the 18th European Weed Research Society Symposium in June in Slovenia, the 7th International Food Legume Research Conference, Marrakech, Morocco, and the 4th International Conference on Agricultural and Biological Sciences in Habgzhou, China. Further details can be found under Forthcoming meetings. Details of other meetings and of the venue for our next WCPP meeting in 2019 will appear in the next issue of Haustorium.

With very best wishes for a successful 2018

Julie

Julie Scholes, IPPS President (j.scholes@sheffield.ac.uk)

MEETING REPORTS

XIX International Botanical Congress, Shenzhen, China, July 23-29, 2017.

The 17th International Botanical Congress was held from July 23-29 in Shenzhen, China. Nearly 7000 participants from 109 countries attended the congress. In total, 212 symposia belonging to six themes were organized, with 1447 oral presentations and 51 specially invited lectures (5 public lectures, 12 plenary lectures and 34 keynote lectures). The weeklong gathering of scientists from all around the world over such a broad scope greatly facilitated academic exchanges across disciplines and encouraged the participants to think outside the box for a better understanding of their research questions. Abstracts can be downloaded at http://www.ibc2017.cn/Download/.

Symposium: Ecology and Evolution of Parasitic Plants

The keynote lecture by Claude dePamphilis, began with a brief introduction to 11 primary lineages of haustorial parasitic plants. The focus was then on data from the Parasitic Plant Genome project and how stage-specific transcriptome data, mainly from *Phelipanche aegyptiaca*, *Striga hermonthica*, and *Triphysaria versicolor*, has led to the discovery of a set of evolutionarily conserved ‘parasite genes’ that are upregulated in parasitic processes of the different parasites, and originated from both Old and New genes that evolved haustorial expression and function. Manipulation of the expression of these genes is helping to understand parasite processes and suggesting ways to interrupt the parasitic process. Stolen genes, obtained via functional horizontal gene transfer (HGT) from ancient host plant lineages, and now expressed in haustorial processes form a third category of parasite genes that can be detected through careful bioinformatic analysis in Orobanchaceae and also in *Cuscuta* where especially large numbers of HGT events are being detected.

The power of comparative transcriptomics was leveraged also by Yasunori Ichihashi, to get the first glimpse at stage- specific gene expression patterns in three different parasite lineages (Orobanchaceae, *Cuscuta*, and *Thesium chinense*). A new low cost method of RNA-seq library construction was used. Comparisons of *Striga* and *Cuscuta* showed stage specific expression patterns, with many similar gene categories being enriched in haustorial libraries. A gene co-expression network found 200 robust hub genes in the *Cuscuta* haustorium cluster. Related genes, encoding a plant-specific transcription factor, Late Organ Boundaries Domain (LBD), is upregulated in haustoria in all three groups. This suggests that recruitment of LBD genes that serve as key developmental regulators may enable the evolution of haustoria in parasitic plants. Functional analysis is underway, with an initial experiment showing that a promoter sequence cloned from *Phtheirospermum japonicum* (Orobanchaceae) LBD gene drives strong expression in specific haustorial cells of this parasite.

Joshua P. Der provided an overview of the astounding diversity of structure and parasitic ability in plants of Santalales, the largest and one of the oldest groups of parasitic plants. Non-parasites, facultative parasite, obligate parasites, trees, shrubs, mistletoes, and highly modified holoparasites (Balanophoraceae) are all found in this order of 160 genera and over 2200 species. He then presented the history and current status of phylogenetic classification of the sandalwoods, which has remained challenging in part due to extremely divergent or missing plastid genes in the holoparasites that made the relationships of Balanophoraceae very difficult to resolve. Published classifications have also disagreed on how many families should be recognized, even when referring to the same phylogenetic evidence. Recent phylogenies, based on seven shared nuclear, mitochondrial, and plastid sequences provide a well-supported backbone phylogeny that places Balanophoraceae confidently within Santalales. Der has launched an extensive new genome sequencing effort of 51 diverse Santalalales species from 17 of 18 family-level clades, 'skimming' of data from all three genomic compartments that is rapidly expanding the molecular evidence available for high resolution phylogenetics. Alignments and phylogenies using multiple phylogenetic methods, provide 100% bootstrap support for all previously recognized families, and added resolution many areas in the tree, allowing inference of the evolutionary history of the mistletoe habit as well as further insights into relationships among major lineages within the order.

Lytton Musselman presented a study led by doctoral student Nicholas Flanders on factors that determine the distribution of the oak mistletoe, *Phoradendron leucarpum*, in the eastern United States. Although capable of parasitizing a wide range of hosts, *P. leucarpum* often has a narrow host range at a given location. What are the factors that determine host preference in a given area, and how are these patterns established and maintained? A combination of local census data and experimental plantings found overall Quercus nigra was the most common host, but maples were most common in other areas, intensity of parasitism varies from location to location. Experiments were done to investigate possible responses to volatile monoterpene cues. Statistical analysis found no significant relationship between local light level and seedling survival and establishment, but hosts in wetlands were more frequently parasitized than the same host species in drier uplands. The foraging and movement patterns of avian frugivores like the cedar waxwing likely play a more influential role in determining the observed host preferences at a given site.

Ai-Rong Li described a rapid and very recent range expansion involving the hemiparasite *Pedicularis kansuensis* in western China. In just two decades, *P. kansuensis* has expanded into large tracts of grassland, reducing foraging quality, and threatening the local livestock industry. Dr. Li's group is performing lab- and field-based experiments to understand what is behind this aggressive expansion and discover potential strategies for limiting its success. *P. kansuensis* appears to maintain high genetic variability as well as morphological and phenotypic plasticity, and like other *Pedicularis* species is a generalist species with many potential hosts. Imbalanced N:P ratios have a strong impact on *P. kansuensis* and the surrounding plant community. Results also indicate that shifts in climate are favoring *P. kansuensis*, as do monocultures of highly suitable hosts, overgrazing and degradation of soil quality, transport of contaminated seed lots, and a frequent lack of understanding about the dangers posed by this newly invasive species.

Peter Toth provided a fascinating analysis of plant-herbivore chemical interactions involving an oligophagous fly, *Phytomyza orobanchia*, that consumes the seed capsules of broomrape (*Orobanche* and *Phelipanche* species), and could act as a potential biocontrol agent for the parasites. Using Y-shaped tubes that allowed flies to choose whether to move toward either host plant or parasitic plant volatile compounds, flies were shown to be attracted by volatile chemical signals emitted by the parasites. Next, organic compounds were collected from 21 different broomrapes and their hosts, and subjected to GC-MS analysis, finding 40 mutually shared volatile compounds in all broomrapes tested. Then, detached antennae were used to measure antennal responses to the chemical signals, making it possible to pick out specific compounds that stimulated an antennal response. From a huge number of detected volatile compounds – about 150 compounds per species - field tests identified ones that were relatively attractive to *P. orobanchia*. Compounds eliciting a large response in the fly antenna included 3-octanol, nonanol, and tricosane, but mixtures of these three in specific ratios were particularly attractive to the fly. The results could be leveraged to create traps that could help to attract seed predators to broomrape infested fields.

Alex Twyford is using high resolution morphometrics and genome scale molecular evidence to better understand a taxonomically complex group of hemiparasites, the British eyebrights (*Euphrasia* spp.). *Euphrasia* plants and flowers are small and species display extensive phenotypic variation when grown on different hosts, leading to highly divergent classifications and recognized species numbers. Charles Darwin himself found this group to be particularly perplexing, and hoped that an energetic young scientist would one day devote himself to its solution, as Twyford is now doing! A huge common garden experiment was performed with many species grown on multiple hosts. Large host-induced phenotypic differences were observed within and among species, but taxonomically important species traits remained relatively stable, providing support for recognized species. In contrast, ITS sequencing gave no species resolution, but did detect deeply diverged diploid vs. tetraploid linages. Large scale genetic evidence from provided with genotyping by sequencing (GBS), resolved eight very clean clusters, some corresponding to species, and others corresponding to geographical areas such as a single island, suggesting the possibility of hybridization in local areas. This led to the important conclusion that species differences in *Euphrasia* could be due to differences in relatively small parts of the genome, and maintained by divergent natural selection.

Susanne Wicke provided a rigorous examination of the evolution of organellar genomes and how nuclear data are helping to better understand the biology and molecular evolution of Orobanchaceae with different degrees of heterotrophic dependence. Due in large part to data generated and analyzed by Dr. Wicke and colleagues, recent years have seen major steps toward the development of a comprehensive understanding of evolution of plastid genomes in parasitic Orobanchaceae. Plastid genomes undergo rampant - and surprisingly rapid - genome reduction and gene loss, as well as accelerated rates of sequence evolution with increasing heterotrophy. In contrast, mitochondrial genomes expand in size in more heterotrophic parasites. Nuclear gene data displays a surprising retention of nuclear-encoded components of photosynthesis-related genes, suggesting a slower loss process in the nuclear genome as compared to the plastome. Shifts in rates of molecular evolution and functional constraint can be detected in parasitic plants in hemiparasitic lineages long before the loss of photosynthesis. Wicke described a co-evolutionary feedback loop that progresses at different rates, but affects all three genomic compartments.

This session was co-chaired by Wenbin Yu and Airong Li under the theme Taxonomy, Phylogenetics and Evolution. Six speakers were invited (as below). Similar to research in other plant groups, investigations of taxonomy, evolution, and symbiotic interactions involving parasitic plants at genomic levels have been hot topics that contribute greatly to our understanding of plant parasitism.

Claude dePamphilis **-** Genomic and evolutionary insights into being a parastic plant: old genes, new genes, stolen genes.
Yasunori Ichihashi - A potential key factor for the evolution of parasitic plants.
Joshua P. Der A phylogenetic analysis of relationships within the sandalwood order (Santalales).
Lytton J, NMusselman - The role of generalist avian frugivores in determining the distribution of the mistletoes *Phoradendron leucocarpum.*
Ai-Rong Li **-** What makes *Pedicularis kansuensis* a successful invader?
Peter Toth - Insect plant interaction in broomrapes.
Alex Twyford **-** On the nature of species differences in hemiparasitic *Euphrasia.*
Susann Wicke **-** Integrating nuclear gene data sheds new lighy on organellar genome evolution in Orobanchaceae.

Symposia - The biology of mycoheterotrophic plants
Sasa Stefanovic - Comparative plastome genomics in Ericaceae: plastid gene losses and rearrangements across all trophic levels
Gerhard Gebauer - Partial mycoheterotrophy is more widespread among orchids than previously assumed: A multi-element stable isotope natural abundance approach
Vincent Merckx - Arbuscular mycorrhizal interactions of mycoheterotrophic plants
Sofia Gomes **-** Global distribution of mycoheterotrophic plants
Sean Graham - Organellar phylogenomics and molecular evolution in mycoheterotrophic plants
Craig Barrett - Plastid genome evolution in mycoheterotrophic orchids
E. Shepeleva - Phylogenetic Analysis of the Mycoheterotrophic Genus Thismia (Thismiaceae, Dioscoreales) Based on Molecular and Morphological Data
Lorenzo Pecoraro - Mycorrhizal Diversity and Nutritional Strategies in the Fully Mycoheterotrophic Orchid Epipogium roseum
Claude DePamphilis - Phylotranscriptomic Analysis of Mycoheterotrophic and Non-mycoheterotrophic Lineages in the Pandanales and Dioscoreales

AiRong Li and Claude de Pamphilis

26th Asian Pacific Weed Science Society Conference, Kyoto, Japan, 19-22 September, 2017.

Relevant presentations:

Shayanowako, A.I.T *et al.* - Screening maize for compatibility with *F. oxysporum* to enhance *Striga Asiatica* (L.) Kuntze. resistance
Na Zhang *et al.,*- iTRAQ-based differential expression proteomics in roots of sunflowers differing in resistance to *Orobanche cumana*
Cumali Özaslan *et al.* - Broomrape infestation in lentil crop and farmer knowledge on the management of parasitic weed species in Diyarbakr province, Turkey
Anil Kumar, R. *et al.* - Herbicidal management of parasitic *Dendrophthoe* in semi- temperate and temperate fruit crops of Jammu-Kashmir Himalayas

LITERATURE HIGHLIGHT

Amino acids for parasitic weed management.

Amino acids are the building blocks of proteins for all biota in agricultural systems. They are intermediaries in the soil nitrogen cycle between degradation of decaying organic matter and the mineralized nitrogen forms ammonium and nitrate. In addition, amino acids appear in the rhizosphere as a result of lysis and active efflux from microbial and plant root cells. While plants and microbes prefer to uptake inorganic nitrogen, they also present the capacity for taking up amino acids using different transport processes that present increased molecular complexity (Owen and Jones, 2001; Nasholm *et al.*, 2009). An increased crop ability to uptake amino acids from the rhizosphere is an interesting trait to select for low nitrogen-input agronomic systems that rely on organic matter (Reeve *et al.*, 2009; Moe 2013). Besides their role as a nitrogen source, the abundance and content of amino acids in the rhizosphere affect microbial phenotypes relevant for rhizosphere function. Microbial motility, colony development or sporulation are known to be influenced by amino acids (reviewed in Moe 2013). On the other hand, certain amino acids toxic to the microbial community are deposited in the soil by some particular species of rhizospheric biota which do not succumb themselves to their own delivered toxicity suggesting a function in ecological niche colonization (Valle *et al.*, 2008). Microbial-derived efflux of amino acids can also be toxic for plants. As an example, Frenching disease is a crop physiological disorder caused by high levels of isoleucine efflux by saprophytic rhizobacteria. In Frenching soils, susceptible crops develop symptoms of chlorosis, wilting and stunting (Steinberg 1946).

Plant growth inhibition observed by abundance of certain amino acids is usually the result of the activation of negative feedback during amino acid biosynthesis. This is the case with branched enzyme networks such as the biosynthesis of aromatic, branched-chain or aspartate-derived amino acids. This regulatory mechanism maximizes efficient exploitation of resources preventing too much of a specific product to be made in detriment of other products that the cell needs as well. Too much of a specific end-product shuts off its production by deactivating an enzyme participating in its synthesis. In some cases, the deactivation of the enzyme induces starvation for other amino acids produced in parallel. For example, in the above-mentioned Frenching disease, high levels of isoleucine efflux by saprophytic bacteria causes the inhibition of acetolactate synthase (ALS) an enzyme in the branched-chain pathway causing valine and leucine starvation. Similarly, key enzymes in the aspartate-pathway of amino acid synthesis can be deactivated by abundance of lysine or threonine or their combination causing methionine starvation. On occasions, such inhibition phenomena limit protein synthesis and growth and can be abolished by exogenous provision of the offended amino acid (Piryns *et al.*, 1988; Henke *et al.*, 1974).

The patterns of amino acid inhibition and rescue depend on a variety of factors including plant species, plant growth stage and amino acid concentration (Henke *et al.*, 1974) which are exploitable in crop protection in order to differentially target pests without detrimental inhibition for the crop species. In fact, several crop protection methods are inspired by the natural process of amino acid inhibition. For example, herbicides such as imidazolinones and sulfonylureas inhibit the enzyme ALS, slowly killing the weed by starving it of branched-chain amino acids (Duggleby *et al.* 2008). Another example is the use of mycoherbicides with enhanced efficacy against weeds through increased efflux of amino acids toxic to the target weed. Such is the case of the 45- to 65-% enhancement of mortality observed in wild hemp treated with valine-overproducing variants of the mycoherbicide *Fusarium oxysporum* f. sp. *cannabis* in comparison to the weed control obtained with the wild-type *F. oxysporum* f. sp. *cannabis* strain (Tiourebaev 1999; Tiourebaev *et al.* 2001). Another alternative is based on the innate ability of allelopathic crops to naturally compete against weeds. Plants deposit through root exudation a complex collection of chemicals with amino acids being the second most abundant class of compounds exuded (Jaeger *et al.*, 1999) which in some cases include amino acids acting as natural herbicidal weapons. Such is the case of roots of festuca grasses that exude a potent herbicidal amino acid m-tyrosine whose weed killing action is probably caused by negative feedback for phenylalanine biosynthesis in weeds growing around them (Bertin *et al.*, 2007). Finally, the direct application of inhibitory amino acids to agricultural soils has been effective not only for the control of weeds such as Canada thristle, red bromegrass, kudzu and cannabis (Sands and Pilgeram 2009) but also other pests such as plant-parasitic nematodes (Zhang *et al.*, 2010).

Broomrapes (*Orobanche* and *Phelipanche* species) are holoparasitic weeds that attack crops withdrawing nutritive resources from their roots via haustorial connections (Parker 2013). They are very difficult to control because once seedlings of broomrape weeds attach to the crop root they merge as a whole organism. It becomes very difficult to inhibit the development of broomrape without damaging the crop. Although broomrapes depend on the crop for essential inorganic and organic resources, they possess their autonomous amino acid biosynthesis pathways which are targeted by the amino acid-inhibiting herbicides glyphosate, imidazolinones and sulfonylureas (Dor *et al.*, 2017). Those herbicides are delivered on the foliage of an herbicide-tolerant crop and transported downwards to the underground parasite across the haustorium (Eizenberg *et al.*, 2013). Those herbicides exert the inhibitory action on the aromatic and branched-chain amino acid-biosynthesis pathways locally in the parasite by inhibiting the parasite encoded EPSPS and ALS without affecting amino acid synthesis in the crop which has been selected to resist the herbicide (Dor *et al.*, 2017). A biotechnological alternative to amino acid-inhibiting herbicides could be engineering future transgenic crops harbouring silencing constructs against the broomrape-encoded ALS or EPSPS genes. Silencing signals that specifically target the expression of parasitic weed-encoded genes have been proved to translocate across the haustorium (Tomilov et al 2008, Aly *et al.*, 2009).

Parasitic weed growth is inhibited by exogenous application of specific amino acids but their mode of action has not been revealed (Vurro *et al.*, 2006; Nzioki *et al.*, 2016; Fernandez-Aparicio *et al.*, 2017). The lack of identification of amino acids that abolish the inhibition renders uncertain whether the inhibitory action observed is caused by specific antimetabolite effect in which negative feedback triggered by the inhibitory amino acid causes starvation for another amino acid essential for parasitic weed growth or, by a separate phenomenon of general amino acid toxicity, of yet unknown molecular basis. Anyway, the effect of amino acids in weed parasitism is considered valuable for developing alternative control strategies because it has the potential to develop species-specific pesticides due to the differential inhibition patterns between parasitic weed species and also between parasitic weed species and their crop hosts. This strategy also has the potential to develop pesticides with low persistence in the soil as the applied amino acids is expected to be rapidly depleted by soil-dwelling microbes (Jones and Kielland, 2012). Preliminary steps towards including amino acids in sustainable management strategies have been taken. For example, the germination of *Phelipanche ramosa* and *Orobanche minor* is inhibited by amino acids such as methionine at concentrations that are not inhibitory to their respective hosts tomato and red clover. Leucine and tyrosine are toxic to *Striga hermonthica* but innocuous to its host maize. The effects of these amino acids at field scale have been investigated in crops of red clover and maize respectively using strategies of direct soil application of methionine or using bioherbicides with high levels of leucine and tyrosine efflux. Both techniques showed significant reduction levels of parasitic weed infection (Nzioki *et al.*, 2016; Fernandez-Aparicio *et al.*, 2017). In addition to amino acid application via direct delivery or microbial efflux, the potential of root exudates containing orobanchicidal amino acids can be investigated in strategies of cover crops or intercrops. For example, root exudates of clover, a host crop for *O. minor* but not for *P. ramosa* are rich in glycine (Lesuffleur *et al.*, 2007). Interestingly, glycine is reported to be a strong inhibitor of *P. ramosa* (Vurro *et al.*, 2006), while it does not inhibit *O. minor* germination (Fernandez-Aparicio *et al.*, 2017). Deploying such an approach opens the way to the design of sustainable alternatives finely crafted against the specific local weed problem. Another possibility could be selecting crops with altered amino acid exudation. In rhizotron experiments performed in our lab, *Phelipanche* seeds showed reduced capability to infect roots of tomato plants with increased efflux of lysine. This preliminary information warrants further investigations towards putting amino acid-based techniques into commercial practice for parasitic weed control.

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STRIGA ASIATICA IN RWANDA

In August 2017 I was part of an Anglican mission team partnered with ECHO (https://www.echonet.org/), an NGO that works with subsistence farmers. We conducted a training session in the village of Mbyo, southeast of the Rwandan capital of Kigale. My part of the endeavor was a presentation on parasitic weeds. In my African experience I never thought of Rwanda as having a serious witchweed problem. But when I asked the farmers if they knew the plant based on images I showed, they said they were familiar with the parasite. So I asked them to bring plants from their farms to the next day’s session. To my amazement 18 of the approximately 35 farmers brought bunches of *Striga asiatica* from their farms, many of them in flower. These plants showed the typical habit of the parasite and had crimson flowers. They were obviously at the end of their growing season as most plants were loaded with seeds.

The crops that were reported as being affected were maize and sorghum. One farmer told me that 15 years earlier his maize field was so heavily infested that he stopped growing maize. After this interval he planted maize and the field was heavily infested in the first year. There seemed to be little knowledge of how the parasite affected the crop or of any control methods.

While *S. asiatica* has been reported from this central African nation, there are few reports of extent or damage. Farmers did not seem acquainted with *Striga hermonthica* nor with *S. gesnerioides*.

Lytton Musselman.

PRESS REPORTS

Weeding out *Striga* from African drylands

Striga experts from Europe, USA, Africa and Asia gathered for two days 28-29 November 2017 at the Biosciences Hub for Eastern and Central Africa (BecA) in Nairobi to discuss viable options for tackling this weed that has plagued sub Saharan African agriculture for decades. Despite its striking purple flowers and potential medicinal uses, the parasitic (nutrient sap sucking) *Striga* weed or witchweed is no innocent pest. A lasting and very damaging weed for the major cereal crops in sub-Saharan Africa, it can cause up to 100% crop losses across millions of hectares of farmland and an annual loss of several billion dollars.
Once the field is infected with *Striga*, farmers can't get rid of this pest easily. Like black dust, these tiny seeds produced in large quantities – one spikelet can produce over 50,000 seeds - spread rapidly within the farming community. The seeds can remain viable for up to 20 years under the right conditions until a host plant, usually a cereal crop like rice, maize, sorghum or millet, emits germination signal molecules called strigolactones at the root zone. The invisible pest develops underground, sucking life from the host root. After a month when it appears over ground, it is almost too late.

Researchers and practitioners have been on the case for decades, yet paradoxically, we still don't know enough about the extent and intensity of *Striga* invasion, judging by the differences in the figures on damage impact circulated by different scientists during the workshop. And although *Striga* biology is now understood up to the molecular level, some practical aspects are not necessarily grasped by smallholder farmers. A young farmer who had just inherited a pristine plot of land borrowed ploughing equipment used in his father's *Striga*-contaminated fields and ended up spreading the weed in one season.
Julie Scholes, a professor from Sheffield University in the UK says there is still a lot to discover at molecular level on how *Striga* and host plants interact. She uses rice as one of the host plants, which she inoculates with *Striga* seeds under rhizotrons, large perplex root chambers that facilitate easier observation of *Striga* invasion of the host and its development. Her work shows that there are different *Striga* ecotypes with varying levels of aggression depending on host plant and agroecologies.

It has been observed that poor soil fertility and drought are worsening *Striga* infection. Harro Bouwmeester, a professor from the University of Amsterdam has researched how soil fertility could affect plant signalling during *Striga* interaction with the host. He reports about 20 different types of strigolactones that may or may not be specific to the host. Experiments in West Africa showed that in phosphate deprived soils, sorghum host plants were producing more strigolactones. On the contrary, phosphate fertilization could reduce *Striga* occurrence by 40 to 80% and improve sorghum harvests by up to 142%. However, similar experiments in maize fields in Eastern Africa showed less effect with nitrogen fertility levels. It shows that further soil and water management research is needed to better understand which soil qualities could block or slow *Striga* infestation.

Prof Abdalla Mohammed who has been breeding *Striga* tolerant sorghum varieties using molecular marker-assisted technologies calls for integrated *Striga* management options combining soil fertility improvement, collective weeding, water conservation and use of improved seeds, as experienced by ICRISAT in Mali.

Many approaches have been tested to fight *Striga* with varying levels of success. These range from low tech solutions, like the use of trap crops, like desmodium a cover crop that induce "suicidal germination" of *Striga* seeds without allowing the *Striga* plantlet to anchor to their roots, to more sophisticated practices, like seed treatment – eg IR maize popularized by the African Agricultural Technology Foundation - or the development of *Striga* resistant crops through plant breeding. Most experts admit that adoption of such innovations has not been high in many African countries although there are limited studies to explain the observed low adoption among farmers.

While Jeff Ehlers, senior programme officer at the Bill and Melinda Gates Foundation recalled working in Western Kenya in late 1980s with 6 million people affected by the weed at the time, recent statistics provided by agricultural economist Hugo deGroote at CIMMYT, who studies *Striga* economics for years, shows that in many parts of Africa, the scenario unfortunately worsened with even more people affected.

There is a call to form an **Alliance for *Striga* Control in Africa** which could define a common research for fast action agenda to fight *Striga* and mobilize governments to reclaim *Striga* infested lands. Like the Economics of Land Degradation Initiative built a case assessing the global cost of inaction on soil fertility, *Striga* experts need to build a narrative on why the fight against *Striga* is still so important today.

Dr Senait Senay, research associate on ecological informatics at International Science & Technology Practice and Policy (INSTEPP), shows how mapping scenarios of pest invasions can help prioritize geography of interventions, evaluate costs and benefits of eradication programmes. The GEMS platform

(GEMS stands for Genetics x Environment x Management x Socioeconomical data) , modelling presence and absence of a pest – *Striga* in this case – against layers of environmental data like climate, soils, can then map the risks of *Striga* infestation now and in the future.

There is an urgent need to work with farmers and social scientists to understand what would trigger adoption or rejection of some interventions. The push pull approach for instance may be effective in pilot testing but farmers who practice intercropping may not want to replace essential food crop like groundnut with desmodium intercrop. While breeding for resistance, plant scientists should consider that farmers may reject a new variety if the shape of the plant, taste and colour of grain are far from their usual expectations.

We need to look at the practicalities, access and affordability of the solutions and ensure we use a multidisciplinary approach including microbiologists, breeders, agronomists, soil scientists, economists and sociologists.

Jerome Bossuet, ICRISAT
Friday, 8 December 2017

Purdue poised to improve sorghum for millions with $5 million grant

Gebisa Ejeta, a distinguished professor in the Department of Agronomy at Purdue University, has received a $5 million grant from the Bill & Melinda Gates Foundation to further his team's research on stronger varieties of sorghum. Purdue University scientists will develop stronger, more versatile varieties of sorghum that have the potential to reach millions of African farmers, The foundation's grant is the second for Gebisa Ejeta, a distinguished professor in the Department of Agronomy and director of the Purdue Center for Global Food Security.

Ejeta(above), the 2009 World Food Prize laureate, was recognized for his work in developing and distributing high-yielding varieties of sorghum that are also drought-tolerant and resistant to *Striga*, a parasitic weed that robs maize, sorghum, rice, pearl millet and sugarcane of necessary nutrients. *Striga* can devastate a crop and impacts more than 100 million people in Africa.

Over the last four years, Ejeta, along with his students and research collaborators, uncovered the basic genetic and biological processes that control *Striga* resistance in sorghum. They identified a gene involved with the release of a chemical from sorghum roots that signals *Striga* seed to germinate and attach to those roots. That has led to the creation of new sorghum varieties that combine *Striga*- and drought-resistance more readily using molecular technology. So far, 961 tons of seed have been distributed to more than 400,000 farmers in Ethiopia and Tanzania. 'With more high-throughput phenotyping and the ability to sequence a large slate of genotypes, we identified an important gene that is foundational for imparting *Striga* resistance,' Ejeta said. 'It helps to move that gene with confidence and consider new ways of exploiting that gene. Some of that we've already been working on.'

This next phase of the program will focus on advancements in biological research, specifically identifying more genes involved in imparting broad-based and durable *Striga* resistance in sorghum and other crops. 'We would have multiple genes that we can move around and pyramid together, so there is no risk of one gene breaking down in the future,' Ejeta said.

The new project will expand to support researchers in Tanzania, Kenya, Rwanda, Sudan, Niger, Nigeria, Burkina Faso and Mali to develop a breeding pipeline for more high-yielding, nutritious, disease-resistant and drought-tolerant varieties of crops. The project plans to support private seed systems that will distribute high-quality hybrid sorghum seeds more effectively in those countries. 'This creates opportunities for farmers and small businesses to engage in gainful employment and develop the agricultural industry in these countries,' Ejeta said.

Brian Wallheimer,

Kenyan scientists find new *Striga r*esistance genes in wild sorghum

Wild sorghum will soon provide a reservoir for resistance genes against *Striga.* A research team lead by Dr. Steven Runo of the Plant Transformation Laboratory (PTL) at Kenyatta University and Professor Michael Timko of University of Virginia has identified three wild sorghum accessions resistant to *Striga hermonthica* (witchweed), a parasitic plant devastating cereal production in Sub-Saharan Africa. *Striga* is a

growing pandemic in Africa and Asia, with ability to destroy a crop with up to a 100% yield loss. Today, 300 million farmers from over 25 countries in Sub-Saharan Africa incur losses in excess of $7 billion annually due to *Striga* infestation. Covering over 100 million hectares, the weed has particularly established host in key regional staple crops maize, sorghum, millet, and upland rice, greatly undermining the efforts to attain food security and economic growth. In a regional collaborative research programme published in Frontiers in Plant Science, the team reports having found potential sources of mechanical and biochemical barriers to *Striga* infection that could be employed in genetic improvement of cultivated sorghum. Wild sorghum immune to *Striga* infestation coexists with the parasite in uncultivated lands in northeastern Africa. This offers an opportunity to pinpoint key resistance genes in wild sorghum that can be stacked in farmer-preferred varieties. This study provides a potential to increase the genetic basis of cultivated sorghum with wide-reaching implications for *Striga* control in other cereal crops by pyramiding multiple resistance genes.
(For more information: e-mail mkarembu@isaaa.org)

Biotechnology News. Outlooks on Pest Management, December 2017

Why the evolutionary link between flowerpeckers and mistletoes is crucial to the forests
(abridged)

Mistletoes sustain a large number of species worldwide – flowerpeckers, the barbet-like tinkerbirds of Africa, the mistletoebird and honeyeaters of Australia, the sunbirds and white-eyes of Asia, mouse lemurs and sifakas of Madagascar, tyrant and silky flycatchers and colocolo opossums of the Americas, the eponymous mistle thrush of Europe, myriad insects and other creatures.
You would hardly notice a flowerpecker in the rainforest – the bird is small enough to hide behind a leaf or to hold in a closed fist, and drab enough to escape the attention of anyone but an ardent birdwatcher. The undistinguished little bird is dull olive brown on top and a rather dingy white below, with a sharp, glinting, dark and attentive eye and a gently curved beak to poke among the flowers. A metallic, fidgety tick-tick-tick call announces her presence as she darts through the boughs. You have to be quick to spot her before she disappears.

I've traveled far from my home in the mountains of the Western Ghats in South India, to see this flowerpecker. And not just any plain flowerpecker, but a particular one: a bird flitting among the mistletoes on the same trees where I had seen the species two decades earlier.
I am seated on the steps of the Dampatlang watchtower in Dampa Tiger Reserve in Mizoram. Seated two stories high on the watchtower, I am almost eye-to-eye with the flowerpecker. The bird flits from branch to branch, dives into each mistletoe cluster, peeking, probing, seeking with eye and beak. Flowerpeckers remain closely tied to the mistletoes that grow on trees. Their territories span a few hectares at most. The birds consume mistletoe flower nectar and fruits, but this is a two-way relationship. The birds pollinate the plant's flowers and disperse its seeds.

Thick-billed flowerpecker on the (non-parasitic) *Helicteres isora*: M.Garg/Wikimedia Commons

Mistletoes have tube-like flowers. When probed by a flowerpecker's beak, these flowers part like a curtain or pop open, dusting the bird's head and face with pollen. After the bird sips the sugary nectar with a special tube-like tongue (who needs a straw when your tongue can roll into one?) she flies to the next flower, rubbing off some of the pollen onto the flower's receptive female parts, triggering the latter plant's reproduction.

Plain flowerpecker with a mistletoe fruit in Dampa Tiger Reserve, Mizoram. Photo TR Shankar Raman

Despite the flowerpecker's name, the birds remain fruit-lovers at heart. Mistletoes often have long and overlapping flowering and fruiting seasons so there is always food for a hungry flowerpecker to find. Ripe mistletoe fruit never fails to attract flowerpeckers. The plain flowerpecker and its close cousin in South India, the Nilgiri flowerpecker, manipulate mistletoe fruits in their beaks to gently squeeze the seed from the pulp. They swallow the sugary, nutritious pulp and wipe their bills on twigs to remove the sticky seed. If the flowerpecker swallows the fruit, the seed passes rapidly through the bird's gut to be excreted out. To remove the still sticky seed, the birds wipe their rears on twigs or tree branches. In either case, these actions have the same result, which biologists call directed dispersal: the mistletoe seed gets planted where it is likely to germinate.

An hour later, I leave with the sense that there is more to this than just a symbiotic evolutionary link between bird and mistletoe in a forest webbed with ecological connections. Perhaps, behind the gleam of that flowerpecker's eye, there resides, too, a desire to cultivate and protect what she consumes and an aesthetic to adorn the trees in her forest with the prettiest little plants she can find.

TR Shankar Raman is a scientist with the Nature Conservation Foundation, Mysore. His email address is: trsr@ncf-india.org

Mistletoe – WD-40?

(This appeared as a Google Alert, August 2nd 2017. We shall be interested to learn if anyone has any experience of the technique.)

Question: I read your column regularly and am interested in the one on mistletoe. I lived in Sierra Vista for 10 years and had five mature mesquite trees that had mistletoe on them. A friend who had lived there for 20 years had a new way to get rid of the parasite. He told me an entomologist friend told him that WD-40 would stop or slow down the mistletoe's return. His instructions were: First cut small branches off at 12 to 14 inches below the growth. Be sure to clean up the stems that come off while removing them. When it's on large branches or the trunk, skin all the mistletoe down to the bark. Spray this area right after with WD-40. The next day, spray again. Watch the spots and if any new sprouts return, do the same thing, the sooner the better. In the remaining years I lived there, it didn't return in those spots and very few new sprouts ever came out. His theory was that WD-40 followed the ingrown fiber of the mistletoe and killed it, like it follows rust on a nut and bolt and softens it.

Answer: Cutting the small branches below the growth is an effective way to reduce the mistletoe if the infection is caught early enough. I hadn't heard of the WD-40 method. The ingredients of WD-40 are a secret according to the manufacturer, so it's hard to be sure of its toxicity to plants. So there might be something to this method, but because we have no research to back it up, it is still a theory. Otherwise, WD-40 is hazardous to breathe, ingest and get on your skin, so be careful when using this product. It is also not registered as an herbicide, so it's technically illegal to use it as such.

This parasitic vine helps plants communicate

Dodder vines (*Cuscuta* species) can tap into multiple hosts, causing damage but also providing botanical wires that let host plants share valuable information.

Dodder vines are parasites with nicknames like devil's guts, hellbine, strangleweed and witch's hair. (Photo: Mironmax Studio/Shutterstock)

Plants are quietly communicating all around us. Some send out chemical signals by air, for example, and many rely on an underground internet built by soil fungi. And some, a new study finds, can use parasitic vines as communication cables. The parasites may be harmful, but they also link multiple plants into a network, and these 'bridge-connected hosts' seem to capitalize by communicating through the vines. The parasites in this study are *Cuscuta,* a genus of about 200 species in the morning glory family. They don't look like much at first, initially rising from the soil as a thin tendril with no roots or leaves. Their growth depends on finding a host, which they do by sniffing out odors from nearby plants. (They can even use scent to track down their favorite hosts, such as tomatoes instead of wheat.) 'It's really amazing to watch this plant having this almost animal-like behavior,' biocommunication researcher Consuelo M. De Moraes told NPR in 2006.

Once it finds a suitable host, a dodder wraps around the stem and inserts fang-like 'haustoria' into the plant's vascular system. A dodder can end up with haustoria in many hosts, forming clusters of connected plants that may include multiple species. As Ed Yong reports in the Atlantic, a single dodder vine is capable of linking dozens of hosts together. 'In our lab, we could connect at least 100 soybean plants with a dodder seedling,' study co-author Jianqiang Wu, a botany professor at the Chinese Academy of Sciences, tells Yong.

The parasites are known to take water, nutrients, metabolites and mRNA from their hosts, and their bridges 'even facilitate host-to-host virus movement,' the study's authors point out. But, as they report in the Proceedings of the National Academy of Sciences, those bridges also seem to boost the hosts' communication abilities. And they aren't just enabling idle chatter: A dodder's network of 'bridge-connected hosts,' as the researchers call them, can perform valuable community services, such as warning each other about an attack from leaf-eating caterpillars.

Many plants are able to resist herbivorous insects, using a variety of tactics to warn their neighbors as well as defend themselves. They may produce defensive toxins, for example, rallying various parts of the plant to coordinate a systemic response. 'Insect herbivory not only activates defenses at the site of feeding,' the researchers write, 'but also induces unknown mobile signals that travel through vasculatures' to other parts of the damaged leaf as well as undamaged leaves and roots. Since plants send these signals through their vascular systems, the researchers wondered if a dodder vine can inadvertently share them among its hosts, creating another channel for communication. To find out, they placed two soybean plants near each other and allowed both to be parasitized by the Australian dodder (*Cuscuta australis*), which soon formed a bridge between the two hosts.

The study used *Spodoptera litura* larvae, aka cluster caterpillars or cotton leafworms. (Photo: traction/Shutterstock)

Next, they infested one of the soybean plants with caterpillars, while keeping its partner pest-free. The second plant hadn't suffered any bites, yet when the researchers examined its leaves, they found it had regulated hundreds of genes — many of which encode anti-insect proteins often used when under attack. When the researchers did let caterpillars attack the second soybean, it 'consistently exhibited elevated resistance to insects,' they write, suggesting its pre-emptive defenses paid off. But what triggered those defenses? To see if its fellow host had really sent a warning via parasitic vine, they conducted similar experiments without the dodder bridge — and found no anti-insect proteins or increased resistance in the second host. They also tested for airborne signals between two unconnected soybean plants, finding no warning like the one between bridge-connected hosts.

Dodder vines may not rival high-speed data cables, but they do transmit their hosts' signals in as little as 30 minutes, the researchers report. The vines can also carry the signals over long distances — at least 10 meters (33 feet) — and even between hosts from different species, such as rockcress and tobacco. Since caterpillars could spell disaster for a soybean plant, this kind of alert seems like a pretty big benefit. Dodder vines are still parasites, though, a term for organisms that sustain themselves at the expense of their hosts. According to the study's authors, a dodder likely harms its victims more than it helps them.
Yet parasites also have an incentive to keep their hosts alive and viable, since they rely on them for long-term support. And even if the net impact is negative, the authors note that some parasites offer benefits beyond not killing their hosts. Roundworms have been shown to increase human fertility, for example, while other helminths can reduce autoimmunity and allergies in human hosts. Being wrapped up by a dodder definitely takes a toll, but the vines 'could alleviate resource-based fitness costs by providing information-based benefits to their hosts,' the researchers write. And the parasite might benefit, too, 'given that better defended and prepared hosts could provide Cuscuta with more nutrients than undefended or naïve hosts in the face of a rapidly dispersing herbivore.'

Still, they add, dodder vines are generalists that can target a wide range of plants, and their networking services are probably a coincidence, not a co-evolved response. More research is needed to really understand this relationship, the researchers say, including how exactly the hosts' signals are spread, how much a dodder's perks offset its costs, and whether those benefits are 'ecologically meaningful.'
In the meantime, research like this can help illustrate how the ecosystems around us — including apparently passive plants — are more sophisticated than they seem.

Russell McLendon September 13, 2017.

Native mistletoe makes a comeback in Canterbury (New Zealand)

Ask me what I was doing in late June, up a ladder smearing bright yellow, rice-sized globules of goo onto one of my kōwhai trees. I could say I was making kissing a whole lot easier in my neighbourhood over Christmas. Or I could have just said I was one of more than 300 Cantabrians taking part in a biodiversity initiative designed to get more native mistletoe growing in the region. Last year, a team led by Christchurch ecologist Kristina Macdonald, along with the University of Canterbury and the Christchurch Botanic Gardens, managed to establish 33 pirita, also known as the green mistletoe (*Ileostylus micranthus*) in the Gardens. It was no easy task. Establishment rate of the mistletoe by human dispersal of the seed is usually about 5 per cent, though the team managed nearly 9 per cent. It is spread naturally by native birds tūī, bellbird and silvereye, and to a lesser extent kererū and (the non-native) blackbird, who eat the berries and pass the seeds out the other end.

Green mistletoe, *Ileostylus micranthus*, is naturally spread by tūī, bellbird and silvereyes.

Although green mistletoe is found throughout New Zealand, it is now seldom seen in Christchurch. Kristina thinks it is an interesting aspect of our native vegetation that people often don't think about. 'We wanted to showcase this and bring it back into the city,' she says. Over two days in late June, when the fruit is at its ripest, about 9000 seeds were collected from two sites, one in the Port Hills and one in Teddington at the head of Lyttelton Harbour. Hundreds responded to the call for volunteers to grow the seed in their own garden. Each was given 20 seeds and, because the seeds' viability drops quickly once picked, was told they had two days to place them in trees.

Like its European counterpart, the green mistletoe is hemiparasitic. It does not grow in soil, but takes nutrients and water from a host plant. However, it still photosynthesises and produces flowers and fruit. One of nine native mistletoes – including the presumed extinct Adams's mistletoe, which was last seen in 1954, and the two beech forest-inhabiting scarlet species – the green mistletoe (as its name suggests) has small green flowers in summer and bright yellow fruit in autumn and winter. An evergreen, it forms dense balls up to 2m in diameter, but more commonly only 1m. It is considered a sight to behold on deciduous trees in winter.

One reason this particular species of mistletoe was chosen was that it has the lowest host specificity, with more than 200 different host species, says Kristina. This meant people were more likely to have a host species in their backyard. Other mistletoes only have between 13 and 48 host species each. I chose kōwhai to plant my seeds in. But coprosma, houhere, mānuka, olearia, pittosporum, pseudopanax, tōtara and wineberry would have all been suitable natives. Recommended among the exotics are acacia, ash, lemon, maple, oak, plum (and other Prunus), robinia, silver birch, tree lucerne and willow.

After duly squishing the seeds onto and into the forks of branches, I waited… and waited. Several months later, most seeds are still there, still glistening, but there does not appear to be much happening. Not to worry, Kristina assures me. 'Some of our ones from last season have taken more than a year to establish,' she says. 'On some of the ones I have looked at from this year, there is a green tip at the edge of the seed, and others haven't changed much. I would hope for germination – cotyledons emerge and look like two tiny leaves – in the next few weeks, but as long as they are holding on there is still hope.'

Peraxilla tetrapetala - red mistletoe in flower. one of the species of New Zealand native mistletoe, much favoured as a food source by possums, in flower at Arthurs Pass. Photo: Nancy Bell.

Peraxilla colensoi - scarlet mistletoe in the Abel Tasman National Park is an 'at risk' plant. It has flowers that are an important source of nectar for birds like tūī, kākā and bellbird.

Mary Lovell-Smith, NZ Gardener

Tenbury mistletoe auction draws crowds in bumper year

From Kent to Scotland, people from across the UK have travelled to Tenbury Wells, Worcestershire, for the town's annual holly and mistletoe auction. One thousand lots of the plant were sold in the second of three auctions held at Burford House Garden Stores. Auctioneer Nick Champion said it was a particularly good year for mistletoe, which may be down to the weather.

For one minute video see: http://www.bbc.co.uk/news/av/uk-england-hereford-worcester-42240007/tenbury-mistletoe-auction-draws-crowds-in-bumper-year (Video journalist: Catherine Mackie)

BBC Hereford & Worcester, 5 December, 2017.

THESIS

Host range and intraspecific competition in the facultative root hemiparasite *Odontites vulgaris*. Uwe Tobias Nickel, MSc Thesis, September 2012. Advisor: Prof. Dr. Diehtart Matthies: Philipps University of Marburg.

Abstract
Host plants are for hemiparasites both their main source of water and nutrients and potential competitors for light. Autotrophic plants can differ widely in their quality as hosts. To investigate the host range of the facultative hemiparasite *Odontites vulgaris* the parasite was grown in single combinations with 25 host species and also without a host in a climate chamber. *O. vulgaris* is a quite independent parasite that can complete its lifecycle without a host. The tested species varied largely in their quality as hosts and affected the growth of the parasites significantly. Shading of the parasite by its hosts had a strong negative effect on the growth of the parasite. The parasite showed most vigorous growth without a host. Legumes were good hosts, grasses were hosts of intermediate quality and non-legume forbs were bad hosts. However, there were good hosts in each of these groups. Good hosts were *Medicago sativa*, *Capsella bursa-pastoris, Trifolium repens, Bromus erectus, Lolium perenne and Matricaria chamomilla.* Very poor hosts were *Plantago lanceolata, Achillea millefolium, Chrysanthemum leucanthemum, Sanguisorba minor, Hieracium pilosella, Daucus carota, Cyno-surus cristatus* and *Anthoxanthum odoratum.* These results show that plants to which haustoria are formed in natural surroundings do not necessarily have to be hosts for the parasite. Surprisingly *O. vulgaris* could accumulate more biomass with the same amount of leaf area when grown without a host than when grown with a host. The different host species influenced architecture and morphology of the parasite and they had a highly significant effect on the chemical composition of the leaves of *O. vulgaris*. Hemiparasites often form haustoria to individuals belonging to the same species. With increasing density in monoculture *O. vulgaris* showed a decrease in biomass, needed more time to flower and formed more roots. Nutrients that were applied on the leaves of single plants were not translocated among individuals. Leaf fertilisation had even a negative effect on the treated plants.

JONNE - MOVING ANNOUNCEMENT

As of 1 January 2018, Jonne Rodenburg will be affiliated to the Natural Resources Institute (NRI) of the University of Greenwich. He will work as Senior Lecturer/Researcher, Agroecology, in the Agriculture, Health and Environment Department. Jonne plans to continue and deepen the type of parasitic weed research he has been doing over the past ten years at the Africa Rice Center, with a focus on cereal production systems in Africa. His contact details will be: NRI, Chatham Maritime, Kent, ME4 4TB, UK; e-mail: j.rodenburg@greenwich.ac.uk.

BOOK

Plants of the World: An Illustrated Encyclopedia of Vascular Plants. Maarten J. M. Christenhusz, Michael F. Fay, and Mark W. Chase. 2017. ISBN 978-0226522920. Hardcover, US $95. Royal Botanical Gardens, Kew and University of Chicago Press. 792 + viii pp.

The bulk of this 7.2 pound (3.3 kilograms) tome is plant families arranged according to the scheme of the Angiosperm Phylogeny Group (APG). Families are listed under their respective orders in the APG system. For the parasitic plant enthusiast this book is a wonderful source on information on every parasitic plant family. Lavishly illustrated, each family treatment has a section on evolution of the group, distribution, economic importance, and uses. Finding a book of 800 pages with over 2500 full color images for less than $100 is noteworthy.

'*LORANTHUS MICRANTHUS*'– CORRECTION

I have in the past been making the wrong assumption in many past editions of Haustorium in equating '*Loranthus micranthus'* in literature from West Africa, with *Ileostylus micranthus*. I may have continued to do so in spite of Dan Nickrent pointing out in Haustorium 66 that '*L. micranthus*' is most probably a mis-spelling of *Loranthus micrantherus,* an accepted synonym for *Englerina gabonensis*, and that *I. micranthus* does not occur in Africa. I apologise for having continued to mislead. By chance there is an item on *I. micranthus* under Press Reports above. I thank Dan for reminding me of my error and for providing the following pics of the two species, very different in flower and in distribution. If any reader has any comment on this correction, we would be pleased to hear from them. We would particularly welcome comment from West Africa, confirming the true identity of '*L. micranthus*'. Pictures below show just how different they are!

Chris Parker.


Ileostylus micranths Photo Pieter Pelser


Englerina gabonensis Photo Jan Wieringa

FORTHCOMING MEETINGS

28th German Conference on Weed Biology and Weed Control 27th February to 1st March 2018 in Braunschweig, Germany.
http://www.unkrauttagung.de/index.php?menuid=1

7th International Food Legume Research Conference, 6-8 May, 2018 in Marrakech, Morocco.Including a session 'Biotic stresses and their management'. Abstracts due by January 31st. http://www.iflrc.org

18th European Weed Research Society Symposium, 'New approaches for smarter weed management', June 17-20, 2018 in Ljubljana (Slovenia). Some papers on parasitic weeds. https://mail.aol.com/webmail-std/en-us/suite

4th International Conference on Agricultural and Biological Sciences (ABS2018), to be held from June 26th to 29th, 2018, in Hangzhou, China.
http://www.absconf.org/

GENERAL WEB SITES

For individual web-site papers and reports see LITERATURE

* these websites may need copy and paste.

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

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 a description of the PROMISE project (Promoting Root Microbes for Integrated *Striga* Eradication), see: http://promise.nioo.knaw.nl/en/about

*For PARASITE - Preparing African Rice Farmers Against Parasitic Weeds in a Changing Environment: see http://www.parasite-project.org/

For the Index of Orobanchaceae prepared by Óscar Sáchez Pedraja, Gerald Schneeweiss and others see: http://www.farmaliergsanes.com/Otrospdf/publica/Orobanchaceae%20Index.htm

For the Annotated Checklist of Host Plants of Orobanchaceae, see: http://www.farmaliergsanes.com/Flora/Angiospermae/Orobanchaceae/Host_Orobanchaceae_Checklist.htm

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

For a compilation from the Mistletoes: Pathogens, Keystone Resource, and Medicinal Wonder Meeting in Ashland, Oregon, July, 2016, see:https://storify.com/D0CT0R_Dave/mistletoe-conference

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/sandalwood

For 6th Mistletoe Symposium, Germany, November 2015 see: http://www.sciencedirect.com/science/journal/09447113/22/supp/S1

LITERATURE

***indicates web-site reference only**

Items in bold selected for special interest

Items in blue relate to therapeutic uses of parasitic plants

Aavik, T., Talve, T., Thetloff, M., Uuemaa, E. and Oja, T. 2017. Genetic consequences of landscape change for rare endemic plants - a case study of *Rhinanthus osiliensis*. Biological Conservation 210(Part A): 125-135. [Concluding that the very rare endemic *R. osiliensis* in Estonia, is endangered by the loss of habitats and also by other changes in landscape composition, e.g. afforestation, leading to strong declines in population size accompanied by genetic bottlenecks, decreased genetic diversity and high inbreeding.]

Abate, M., Hussien, T., Bayu, W. and Reda, F. 2017. Diversity in root traits of sorghum genotypes in response to *Striga hermonthica* infestation. Weed Research 57(3): 303–313. [Comparing the root traits of 9 sorghum genotypes with varying susceptibility to *S. hermonthica* under infested and uninfested conditions. Claiming to show that low root traits are an indication of resistance.]

*Abdulmalik, R.O., Menkir, A., Meseka, S.K., Unachukwu, N., Ado, S.G., Olarewaju, J.D., Aba, D.A., Hearne, S., Crossa, J. and Gedil, M. 2017. Genetic gains in grain yield of a maize population improved through marker assisted recurrent selection under stress and non-stress conditions in West Africa. Frontiers in Plant Science 8(May): 841. (https://www.frontiersin.org/articles/10.3389/fpls.2017.00841/full) [This study demonstrated the effectiveness of marker-assisted recurrent selection in increasing the frequency of favourable alleles for tolerance to drought without disrupting the level of resistance to *Striga hermonthica* in a bi-parental population targeted as a source of improved maize inbred lines.]

Agbo, M.O., Odimegwu, D.C., Okoye, F.B.C. and Osadebe, P.O. 2017. Antiviral activity of Salidroside from the leaves of Nigerian mistletoe (*Loranthus micranthus* Linn) parasitic on *Hevea brasiliensis* against respiratory syncytial virus. Pakistan Journal of Pharmaceutical Sciences 30(4): 1251-1256. [Describing the isolation of a polyphenol, salidroside, from '*L. micranthus'* (presumably a misspelling of *L. micrantherus* which is a synonym of *Englerina gabonensis*)), showing potential as an antiviral agent against respiratory syncytial virus infection.]

*Ahn JongMin, Chae HeeSung, Chin YoungWon and Kim JinWoong. 2017. Dereplication-guided isolation of new phenylpropanoid-substituted diglycosides from *Cistanche salsa* and their inhibitory activity on NO production in macrophage. Molecules 22(7): 1138. (http://www.mdpi.com/1420-3049/22/7/1138/htm)

Al-Menhali, A.S., Jameela, S.A., Latiff, A.A.. Elrayess, M.A., Alsayrafi, M. and Jaganjac, M. 2017. *Cistanche tubulosa* induces reactive oxygen species-mediated apoptosis of primary and metastatic human colon cancer cells. Journal of Applied Pharmaceutical Science 7(5): 39-45. [The results suggest that *C. tubulosa* is a promising candidate for additive anti-colon cancer therapy.]

Al-Musayeib, N.M., Ibrahim, S.R.M., Musarat Amina, Al-Hamoud, G.A. and Mohamed, G.A. 2017. Curviflorside and curviflorin, new naphthalene glycoside and flavanol from *Plicosepalus curviflorus*. Zeitschrift für Naturforschung. Section C, Biosciences 72(5/6): 197-201. [Curviflorside and curviflorin, also (+)-catechin and quercetin isolated from *P. curviflorus* in Saudi Arabia.]

Albert, S., Rhumeur, A., Rivière, J.L. Chauvrat, A., Sauroy-Toucouère, S., Martos, F. and Strasberg, D. 2017. Rediscovery of the mistletoe *Bakerella hoyifolia* subsp. *bojeri* (Loranthaceae) on Reunion Island: population status assessment for its conservation. Botany Letters 164(3): 229-236. [This species, thought to be extinct, was rediscovered on Reunion. One population consisting of six individuals was found growing on five host plant species from different families. The grey white-eye, *Zosterops borbonicus*, was seen visiting flowers. Possible reason for decline on Reunion, compared with Madagascar and Mauritius considered to be a loss of frugivorous vertebrates early in settlement of the island.]

Anshul Arya and Geeta Sharma. 2017. Evaluation of efficacy of different botanicals against sugarcane Pokkah boeng disease causing fungus *Fusarium moniliforme* var *subglutinans* Sheldon. Environment and Ecology 35(3D): 2409-2412. [*Cuscuta reflexa* among the 'botanicals' inhibiting growth of *F. moniliforme* var *subglutinans*]

Ateeque Ahmad, Sudeep Tandon, Tran Dang Xuan and Zulfa Nooreen. 2017. A review on phytoconstituents and biological activities of *Cuscuta* species. Biomedicine & Pharmacotherapy 92: 772-795. [A detailed review of the reported constiuents and uses of 24 species of *Cuscuta*.]

Aybeke, M. 2017. *Fusarium* infection causes genotoxic disorders and antioxidant-based damages in *Orobanche* spp. Microbiological Research 201: 46-51. [Including conclusions that *F. oxysporum* induced significant irrevocable genotoxic effects on the DNA of unspecified *Orobanche*, degraded protein metabolism and synthesis, and finally triggered apoptosis.]

Ba XueLi, Zhang AiLian, Huang Jiong, Cao Hui, Zhao Bing and Wang DanYang. 2017. (Adjuvant effect of Xinjiang wild *Cistanche deserticola* Y.C.Ma crude polysaccharides on foot-and-mouth disease vaccines in mice.) (in Chinese) Acta Veterinaria et Zootechnica Sinica 48(8): 1535-1542. [A preparation of 'crude polysaccharides' from *C. deserticola* enhanced foot-and-mouth disease specific antibody levels over a long period, significantly enhanced the T cell immune response and showed no undesirble side effects.]

Badu-Apraku, B., Oyekunle, M., Talabi, A.O., Annor, B. and Akaogu, I.C. 2017. Changes in genetic variances and heritabilities in an early white maize population following S_1 selection for grain yield, *Striga* resistance and drought tolerance. Journal of Agricultural Science 155(4): 629-642. [Three cycles of selection were evaluated under drought and well-watered conditions at two locations in Nigeria for 2 years to determine genetic variability, gains from selection and predict response to selection for grain yield and other traits. Predicted gain based on C_3 was 0.282 and 0.583 t/ha under drought and well-watered conditions. Low genetic variances, heritabilities and predicted gain for yield and other traits suggested a need to introgress drought tolerance genes into the population.]

Bao Han, Zhang QingWen, Ye Yang and Lin LiGen. 2017. Naturally occurring furanoditerpenoids: distribution, chemistry and their pharmacological activities. Phytochemistry Reviews 16(2): 235-270. [Reviewing the various naturally occurring furanoditerpenoids and their pharmacological activities and noting their occurrence in some Olacaceae.]

Bayram, Y. and Çıkman, E. 2017. Investigation of efficiency of *Pytomyza orobanchia* Kaltenbach (Diptera: Agromyzidae) on *Orobanche aegyptiaca* Pers. and *O. ramosa* Linnaeus (Orobanchaceae) in tomato fields at Diyarbakır and Mardin provinces. Journal of Tekirdag Agricultural Faculty 14(2): 16-21. [Introducing 6 or 8 *P. orobanchia* pupae into a small cage enclosing 1 or 2 *Orobanche* stems resulted in greatly increased infestation of the parasite capsules and presumably reduced carry-over of seed, but no data on long-term benefit.]

Belaeva, T.N., Prokopyev, A.S., Butenkova, A.N. and Astafurova, T.P. 2017. Pollination ecology and seed production of some species of the genus *Pedicularis* L. in the highlands of Altai. **:** International Journal of Environmental Studies 74(5): 744-751. [The species of *Pedicularis* investigated (not specified in abstract) have high fertility and viability of the pollen grains. Seed production ranges from 57.1 to 261.3 seeds per stem. Germination depends on cold stratification. Host plants include 27 species.]

Bellot S., Cusimano N., Luo S., Sun G., Zarre S., Groger A., Temsch E., and Renner S.S. 2016. Assembled plastid and mitochondrial genomes, as well as nuclear genes, place the parasite family Cynomoriaceae in the Saxifragales. Genome Biology and Evolution 8(7):2214–2230. [The *Cynomorium* mitochondrial genome consists of up to 49 circular subgenomes and has a gene content similar to that of photosynthetic angiosperms. Its plastome retains only 27 of the normally 116 genes. Nuclear, plastid and mitochondrial phylogenies place Cynomoriaceae in Saxifragales, a placement already shown by Nickrent *et al.* 2005.]

Bentley, J., van Mele, P., Touré, S., van Mourik, T., Guindo, S. and Zoundji, G. 2017. Seeds of the devil weed: local knowledge and learning from videos in Mali. In: Sillitoe, P. (ed.) Indigenous knowledge: enhancing its contribution to natural resources management: 75-85. [A series of videos relating to control of *Striga hermonthica* are described, involving the use of hand pulling, making compost, micro-dosing fertilizer. Organizational changes included: strengthening women groups, adding *Striga* pulling to their repertoire of services and organizing farmers to watch videos. The videos are claimed to have made a significant contribution.]

*Bisi-Johnson, M.A., Obi, C.L., Samuel, B.B., Eloff, J.N. and Okoh, A.I. 2017. Antibacterial activity of crude extracts of some South African medicinal plants against multidrug resistant etiological agents of diarrhoea. BMC Complementary and Alternative Medicine 17(321): 19 June 2017. (https://bmccomplementalternmed.biomedcentral.com/track/pdf/10.1186/s12906-017-1802-4) [*Hydnora* *africana* included in the study as it is used traditionally in treatment of diarrhoea, but apparently rather less active than most other preparations included.]

Bukowiec, G. and Bednarz, B. 2017. (Effect of common fir-tree mistletoe (*Viscum album* ssp. *abietis*) on tree-ring widths of silver fir (*Abies alba*).) (in Polish) Acta Scientiarum Polonorum - Silvarum Colendarum Ratio et Industria Lignaria 16(2): 77-83. [Higher levels of infestation by *V. album* ssp. *abietis* significantly reduced annual tree-ring widths. During water deficiency periods it could be an important factor contributing to the silver fir decay.]

Caraballo-Ortiz, M.A., González-Castro, A., Yang, S., dePamphilis, C.W. and Carlo, T.A.. 2017. Dissecting the contributions of dispersal and host properties to the local abundance of a tropical mistletoe. Journal of Ecology 105: 1657–1667. [The dispersal and adaptation of the mistletoe *Dendropemon caribaeus* (Loranthaceae) in Puerto Rico was studied. Compatibility between the mistletoe and host, measured by mistletoe survival and growth rate, was the most important factor for mistletoe abundance followed by phenological characteristics of the hosts.]

*Charney, N.D. and; Record, S. 2016. Combining incidence and demographic modelling approaches to evaluate metapopulation parameters for an endangered riparian plant.AoB Plants 8: plw044. (https://academic.oup.com/aobpla/article/2609599/Combining-incidence-and-demographic-modelling) [Describing the modeling of habitat turnover rates, colonization rates and dispersal scales for *Pedicularis furbishiae* , a rare endemic to the Saint John River on the border of Maine, USA and predicting that observed habitat patches averaging 550 m in length receive colonizing seedlings with a yearly probability of 0.45 or 0.54, based on two different models. The results help in understanding the impact that increasing rates of habitat turnover would have on the future survival of this species.]

*Cheng Xi, Floková, K., Bouwmeester, H. and Ruyter-Spira, C. 2017. The role of endogenous strigolactones and their interaction with ABA during the infection process of the parasitic weed *Phelipanche ramosa* in tomato plants. Frontiers in Plant Science 8(March): 392. (https://www.frontiersin.org/articles/10.3389/fpls.2017.00392/full) [Strigolactone-deficient tomato plants (*Solanum lycopersicum*; *SlCCD8* RNAi lines), infected with pre-germinated *P. ramosa* seeds, display an increased infection level and faster development of the parasite, suggesting a positive role for strigolactones in host defence against the parasitic. Interactions with ABA are also described.]

Chu HongBiao, Zhang ZhiHua, Chen Dong, Wang Xi, Tu QiLong. 2017. Content determination of phenylpropanoids and enhancing exercise ability of effective fractions in pedicularis densispica. Pharmacognosy Magazine 13(50): 230-235. [Describing an HPLC method for simultaneous determination of salidroside, verbascoside, iso-verbascoside, leucoseptoside A, jionoside D and martynoside in *Pedicularis densispica*.]

Cofta, G., Kwaśniewska-Sip, P., Grześkowiak, W. and Szulc, A. 2016. Possibilities of natural substances for wood preservation against mould. Annals of Warsaw University of Life Sciences - SGGW, Forestry and Wood Technology 94: 105-108. [An alcohol extract from mistletoe '*Visci herbae recentis intractum*' (presumably from *Viscum album*) showed fungistatic activity against *Aspergillus niger, A. versicolor, Aureobasidium pullulans, Penicillium funiculosum* and *Trichoderma virens*.]

*Cohen, Y., Roei, I., Blank, L., Goldshtein, E. and Eizenberg, H. 2017. Spatial spread of the root parasitic weed *Phelipanche aegyptiaca* in processing tomatoes by using ecoinformatics and spatial analysis. Frontiers in Plant Science 8(June): 973. (https://www.frontiersin.org/articles/10.3389/fpls.2017.00973/full) [Studying the importance of three factors on incidence of *P. aegyptiaca* in tomato - crop rotation, infestation history and proximity to infested tomato fields. Confirming that all three are important, and showing that seeds can be blown up to 90 m from adjacent fields.]

Colbach, N.,Bockstaller, C., Colas, F., Gibot-Leclerc, S., Moreau, D., Pointurier, O. and Villerd, J. 2017. Assessing broomrape risk due to weeds in cropping systems with an indicator linked to a simulation model. Ecological Indicators 82: 280-292. [Assessing the various potential for weeds to influence infestations of *Phelipanche ramosa* by e.g. increasing infestation causing germination near crop roots, or by supporting the parasite to maturity and increasing the soil seed bank; or by reducing soil seed bank via suicidal germination. Early summer-emerging weed species increased parasite risk. No other notable correlations were found.]

Costa, R.M.P.B., Albuquerque, W.W.C., Silva, M.C.C., de Paula, R.A., Melo, M.S., Oliva, M.L.V. and Porto, A.L.F. 2017. Can γ-radiation modulate hemagglutinating and anticoagulant activities of PpyLL, a lectin from *Phthirusa pyrifolia*? International Journal of Biological Macromolecules 104(Part A): 125-136. [This species is now known as *Passovia pyrifolia*]

Coulerie, P. and Poullain, C. 2016. New Caledonia: a hot spot for valuabl chemodiversity Part 3: Santalales, caryophyllales, and asterids. Chemistry & Biodiversity 13(4): 366-379. [A total of 176 original natural compounds identified from Santalaless, Caryophyllales, and asterids. Showing that the high rate of endemism is correlated with the originality of phytochemicals encountered in New Caledonian plants and discussing the economic potential of plants and molecules with consideration of their medicinal and industrial perspectives.]

da Silva Freitas, L., Moreira, L.M., de Avila Júnior, R.S., Felestrino, É.B., Demarco, D., de Sousa, H.C. and Ribeiro, S.P. 2017. Reproductive phenology and floral visitors of a *Langsdorffia hypogaea* (Balanophoraceae) population in Brazil. Flora (Jena) 233: 51-57. [Recording high levels of both pollinators and herbivores on *L. hypogaea*, ants being the most frequent floral visitor but a coleopteran (Nitidulidae, Stelidota) more important as a pollinator. Because of herbivory only 12% of flowers fruited.]

Dobrecky, C.B., Flor, S.A., López, P.G., Wagner, M.L. and Lucangioli, S.E. 2017. Development of a novel dual CD-MEKC system for the systematic flavonoid fingerprinting of *Ligaria cuneifolia* (R. et P.) Tiegh. - Loranthaceae - extracts. : Electrophoresis 38(9/10): 1292-1300. [The described method is a 'suitable alternative' to HPLC. Extracts of *L. cuneifolia* have anti-microbial activity.]

*Dor, E., Galili, S., Smirnov, E., Hacham, Y., Amir, R. and Hershenhorn, J. 2017. The effects of herbicides targeting aromatic and branched chain amino acid biosynthesis support the presence of functional pathways in broomrape. Frontiers in Plant Science 8(May) 707. (https://www.frontiersin.org/articles/10.3389/fpls.2017.00707/full) [The mode of action of herbicides targeting aromatic and branched-chain amino acid, imazapic and glyphosate, in controlling *Phelipanche aegyptiaca* was studied to clarify if this obligatory parasite has its own machinery for amino acid biosynthesis. It was found that *P. aegyptiaca* is able to synthesize branched-chain and aromatic amino acids through the activity of acetolactate synthase (ALS) and 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS), respectively.]

*Dubey, N.K., Eizenberg, H., Leibman, D., Wolf, D., Edelstein, M., Abu-Nassar, J., Marzouk, S., Gal-On, A. and Radi Aly. 2017. Enhanced host-parasite resistance based on down-regulation of *Phelipanche aegyptiaca* target genes is likely by mobile small RNA. Frontiers in Plant Science 12 September 2017. (https://doi.org/10.3389/fpls.2017.01574) [Control of parasitic weeds based on trans-specific gene-silencing of three parasite genes was examined. Two strategies to express dsRNA containing selected sequences of three *P. aegyptiaca* genes *PaACS, PaM6PR*, and *PaPrx1* (pma) were examined. The results pointed to a movement of mobile exogenous siRNA from the host to the parasite, leading to the impaired expression of essential parasite target genes.]

Duca, M. and Tabara, O. 2016. Histochemical aspects of *Helianthus annuus* L. - *Orobanche cumana* Wallr. pathosystem. Analele Ştiinţifice ale Universităţii 'Al I Cuza' din Iaşi. (Serie Nouă) Secţiunea II a. Biologie Vegetală 62(2): 19-28. [Histological study revealed abundant accumulation of lignin and callose in the roots of sunflower resistant to *O. cumana* cultivated in infested soil. The results indicated that the phenylpropanoid pathway was activated, synthesis of lignin was increased and the cell wall was fortified.]

ElKhair, K.H., Hassan, M.H., Rugheim, AS.M.E., Ahmed, M.M., Abakeer, R.A., Abusin, R.M.A., Osman, A.G., Abdelgani, E. and Babiker, A.E. 2017. Potential role of intercropping, bacterial strains and inorganic fertilizers in integrated *Striga hermonthica* management on sorghum. Advances in Experimental Biology 11(8): 1-10. [In one pot experiment, sorghum growth was maximal and *S. hermonthica* minimal when intercropped with groundnut. In the second, intercropping plus treatment with a combination of *Bradyrhizobium* spp. and *Bacillus megatherium* ssp. *phosphaticum* and nitrogen gave optimal results.]

Ennami, M., Briache, F.Z., Gaboun, F., Abdelwahd, R., Ghaouti, L., Belqadi, L., Westwood, J. and Mentag, R. 2017. Host differentiation and variability of *Orobanche crenata* populations from legume species in Morocco as revealed by cross-infestation and molecular analysis. Pest Management Science 73(8): 1753-1763. [Demonstrating race specificity of *O. crenata* adapted to lentil. The ability to parasitize faba bean is retained, but races adapted to lentil fare better on lentil hosts than those adapted to faba bean]

Evcİ, G., Pekcan, V., Yİlmaz, I.M., Cıtak, N., Tuna, N., Ay, O., Pilaslı, A. and Kaya, Y. 2016. Determination of yield performances of oleic type sunflower (*Helianthus annuus* L.) hybrids resistant to broomrape and downy mildew. EKIN, Journal of Crop Breeding and Genetics 2(1): 45-50. (https://www.cabdirect.org/cabdirect/FullTextPDF/2017/20173252964.pdf [Reporting from trials in Turkey, on a range of hybrids, at least some showing good resistance to *Orobanche cumana* and high oil content.]

***Fernández-Aparicio, M., Bernard. A., Falchetto, L., Marget, P., Chauvel, B., Steinberg, C., Morris. C.E., Gibot-Leclerc, S., Boari, A., Vurro, M., Bohan, D.A., Sands, D.C. and Reboud, X. 2017. Investigation of amino acids as herbicides for control of *Orobanche minor* parasitism in red clover. Frontiers in Plant Science 22(8): 842. (https://www.ncbi.nlm.nih.gov/pubmed/28588599) [On the principle that certain amino acids induce inhibitory effects in plant growth due to feedback inhibition of metabolic pathways, confirming in laboratory studies that lysine, methionine and tryptophan at 5, 2.5, and 1.25 mM strongly interfere with early development of**

O. minor. Field research confirmed their inhibitory effect but revealed that methionine was more effective than the others, and that two successive applications of 6 L m^{-2} of 20mM solution at 308 and 543 growing degree days inhibited _O. minor_ emergence in red clover up to 67%.]

Fontúrbel, F.E., Jordano, P. and Medel, R. 2017. Plant-animal mutualism effectiveness in native and transformed habitats: assessing the coupled outcomes of pollination and seed dispersal. Perspectives in Plant Ecology, Evolution and Systematics 28: 87-95. [Unexpectedly finding that in the tripartite system of mistletoe *Tristerix corymbosus*, hummingbird pollinator, and marsupial seed disperser, pollination and seed dispersal was not reduced in a transformed habitat, suggesting that the overall system benefitted from the presence of a native understory vegetation that attracts pollinators and seed dispersers and compensates for the often detrimental effects of habitat transformation.]

*Fontúrbel, F.E., Salazar, D.A. and Medel, R. 2017. Increased resource availability prevents the disruption of key ecological interactions in disturbed habitats. Ecosphere 8(4): e01768. (http://onlinelibrary.wiley.com/doi/10.1002/ecs2.1768/full) [Studying the pollination of *Tristerix corymbosus* in Chile by the hummingbird, *Sephanoides sephaniodes,* and its dispersed by the marsupial. *Dromiciops gliroides* in relation to habitat modification. Both are most effective in the presence of shrub and bamboo cover and moss abundance. More open habitats favour other fleshy-fruited plants which provide alternative food for the marsupial. Same study as above?]

Fry, E.L. 2017. Plant, soil and microbial controls on grassland diversity restoration: a long-term, multi-site mesocosm experiment. Journal of Applied Ecology 54(5): 1320-1330. [A study on 3 sites over 5 years in UK indicated that successful restoration of species-rich grassland is dependent primarily on priority effects, especially in the form of early-coloniser species that suppress establishment of slow-growing target species. Including discussion of the role of *Rhinanthus minor*.]

*Fu Weirui, Lin Xiaoqing, Zhang Naixin, Song Zhiping, Zhang Wenju, Yang Ji and Wang Yuguo. 2017. Testing the hypothesis multiple origins of holoparasitism in Orobanchaceae: phylogenetic evidence from the last two unplaced holoparasitic genera, *Gleadovia* and *Phacellanthus*. Frontiers in Plant Science 8: (article 1380). (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5559707/) [Phylogenetic analysis of three nuclear and two plastid genes indicated holoparasitism evolved in the family three times. *Gleadovia* and *Phacellanthus* were placed in tribe Orobancheae and the latter should be merged with *Orobanche* sect. *Orobanche* (the authors apparently do not recognize segregate genera such as *Phelipanche*).]

*Fukui, K., Yamagami, D., Ito, S. and Asami, T.A 2017.Taylor-made design of phenoxyfuranone-type strigolactone mimic. Frontiers in Plant Science 8(June): 936. (https://www.frontiersin.org/articles/10.3389/fpls.2017.00936/full) [Through the chemical modification of debranones (phenoxyfurarones), that are highly active in inhibiting rice tillering but less active on *Striga* germination, novel debranones have been developed carrying two electron-withdrawing groups on the benzene ring with higher *Striga* germination stimulation activities and lower inhibitory activities on rice tillering.]

Funamoto, D.and Sugiura, S. 2017. Japanese white-eyes (Aves: Zosteropidae) as potential pollinators of summer-flowering *Taxillus kaempferi* (Loranthaceae). Journal of Natural History 51(27/28): 1649-1656. [Field observations in Japan showed that *Z. japonicus* was the almost exclusive flower visitor of *T. kaempferi*. Pollen was observed on the bill and face of *Z. japonicus,* and it is believed that it may act as an important pollinator of the mistletoe.]

Gaba, S. and 15 others. 2017. Response and effect traits of arable weeds in agro-ecosystems: a review of current knowledge. Weed Research 57(3): 123–147. [Including a detailed discussion of the factors influencing the success of parasitic weeds, including *Orobanche, Phelipanche*, etc. in arable systems.]

Gao HongWei and 12 others. 2017. Isoacteoside, a dihydroxyphenylethyl glycoside, exhibits anti-inflammatory effects through blocking toll-like receptor 4 dimerization. British Journal of Pharmacology 174(17): 2880-2896. [Isoacteoside from *Monochasma savatieri* (a hemi-parasite in Orobanchaceae occurring in Eastern Asia and widely used in Chinese medicine) blocked TLR4 dimerization, which activates the MyD88-TAK1-NF-κB/MAPK signalling cascades and TRIF pathway. The reults indicate that isoacteoside has potential for the treatment of inflammatory diseases.]

Gao YuQiu, Qin GuangQiu, Wen PingJing, Wang YanWu, Fu WeiZhong, He Li, Yao Siyu and Zhao Peng. 2017. Safety assessment of powdered *Cistanche deserticola* Y. C. Ma by a 90-day feeding test in Sprague-Dawley rats. Drug and Chemical Toxicology 40(4): 383-389. [No toxicity to rats was detected in a diet containing up to 8% of powdered *C. deserticola.* The upper safety level was a total 8 g/kg body weight.]

Gao ZiTong, Wang LiLi, Wang XiaoYue, Liu Yang and Han JianPing. 2017. Authenticity survey of Cuscutae Semen on markets using DNA barcoding. Chinese Herbal Medicines 9(3): 218-225. [33 commercial samples supposedly containing *Cuscuta chinensis* or *C. australis* were analysed against a DNA bar-code and only 10 were found to be genuine.. Two thirds were based on a wide range of other species including *C. japonica, C. alata* asnd *C. monogyna.*]

Garba, Y., Ahmed, B., Katung, M.D. Lawal, A.F. and Abubakar, H.N. 2017. Profitability of *Striga* tolerant maize variety (SAMMAZ 17) amongst smallholder farmers in Lapai, Niger State, Nigeria. South African Journal of Agricultural Extension 45(1): 1-9. [The local maize variety supported high *Striga hermonthica* infestation with a yield of only 1.7 t/ha, while the tolerant SAMMAZ 17 had less *Striga* and yielded 4.4 t/ha. and is recommended for planting in North Central Nigeria.]

Gardner, E.M. 2017. A vascular flora of the Kiavah Wilderness, Scodie Mountains, Kern County, California. Aliso 35(1): 1-27. [Three 'special status' taxa previously documented in the Wilderness, not relocated, included *Cordylanthus rigidus* subsp. *brevibracteatus* (Orobanchaceae).]

Gong Bin, Wu Xin, Wei Ting, Liao RiQuan, Su BenWei, Song JingJing, Jiang GuoHuan and Zhu KaiXin. 2017. (Isolation, identification and antitumor activity of endophytic fungi in *Taxilli herba* from *Salix babylonica* in Guangxi.) (in Chinese) Guangxi Zhiwu / Guihaia 37(5): 634-641. [A range of endophytic fungi were isolated and identified from stems, leaves and roots of *Taxillus chinensis* growing on *Salix babylonica* and some found to have anti-tumour properties.]

González F, Pabón-Mora N. 2017. Floral development and morphoanatomy in the holoparasitic *Pilostyles boyacensis* (Apodanthaceae, Cucurbitales) reveal chimeric half-staminate and half-carpellate flowers. International Journal of Plant Science 178(7): 522-536. [The floral anatomy of this *Pilostyles* species is illustrated with LM and SEM, and features, apomorphic and synapomorphic with other members of Cucurbitales ,are described. The presence of chimeric flowers shows a more labile sex expression than pure monoecy.]

Griffiths, M.E., Ruiz, N. and Ward, D. 2017. Mistletoe species richness patterns are influenced more by host geographic range than nitrogen content. African Journal of Ecology 55(1): 101-110. [Challenging a previous hypothesis that mistletoes preferentially parasitize hosts with high nitrogen, this study concluded that mistletoe species richness increases on hosts with larger geographic ranges.]

*Grímsson F., Kapli P., Hofmann C.-C., Zetter R., and Grimm G.W. 2017. Eocene Loranthaceae pollen pushes back divergence ages for major splits in the family. PeerJ 5: e3373. (https://peerj.com/articles/3373/) [Newly described and existing fossil pollen were used to test molecular dating estimates of Loranthaceae diversification. Root parasites and aerial parasites (Psittacanthinae and Loranthinae) were present in the northern hemisphere at the end of the Eocene, thus pushing back the age of the crown group compared with earlier estimates.]

Guimarães, A.R., Vix, A., Bête, P.D.T., Spindola, D.G., Oliveira, C.R. and Lagareiro Netto, A.A. 2016. (Potentially adaptogenic plants used in Brazilian folk medicine: *Ptychopetalum olacoides*, *Pfaffia* spp. e *Trichilia catigua*.) Revista de Fitoterapia 16(2): 131-138. [*Ptycopetalum olacoides,* known for its anti-inflammatory, antioxidant, antibacterial and immunostimulant effects, among species of potential value for countering stress.]

Hailu, G., Khan, Z.R., Pittchar, J.O. and Ochatum, N. 2017. Radio and mobile phone ownership or access by smallholder farmers of eastern Uganda and its potential use for push-pull technology dissemination. International Journal of Agricultural Extension 5(2): 19-28. [A survey concluding that most farmers have access to both radio and mobile phones but radio is much more used for information on agricultural technology including the use of the push-pull technique for control of stem borers and *Striga*.]

Hasenstab-Lehman, K.E. 2017. Phylogenetics of the borage family: delimiting Boraginales and assessing closest relatives. Aliso 35(1): 41-49. [A molecular phylogeny using three chloroplast genes was used to assess the relationship of Boraginales to other orders and examine family relationships within. Recognition of Lennoaceae as separate from Ehretiaceae is supported.]

*Hill, R., Loxterman, J.L. and Aho, K. 2017. Insular biogeography and population genetics of dwarf mistletoe (*Arceuthobium americanum*) in the Central Rocky Mountains. Ecosphere 8(5): e01810. (http://onlinelibrary.wiley.com/doi/10.1002/ecs2.1810/full) [A detailed ecological study comparing populations of *A. americanum* on lodegpole pine (*Pinus contorta* subsp. *latifolia*), in isolated 'island' populations with those in 'mainland' populations. As predicted by biogeographic theory, island allelic richness was positively correlated with geographic size of the population and negatively correlated with distance from mainland populations.]

Hira Lal, Devendra Singh and Jat, B.L. 2017. *Orobanche* infestation in Indian *Brassica juncea* L. in Ajmer districts of Rajasthan and its management. Asian Journal of Environmental Science 12(1): 1-22. [A long and detailed paper concluding that the most economically effective means to control *P. aegyptiaca* in *B. juncea* involved 125% of recommended fertilizers (N and P) plus foliar sprays of glyphosate at 25 and 50g/ha (plus ammonium sulphate) at 25 and 55 days after sowing. Applications of neem cake with or without pendimethalin and metalaxyl were not suitable.]

Hosseini, P., Ahmadvand, G., Oveisi, M., Morshedi, P. and Gonzalez-Andujar, J.L. 2017. A modelling approach for predicting the initial phase of Egyptian broomrape (*Phelipanche aegyptiaca*) parasitism in potato Crop Protection 100: 51-56. [*P. aegyptiaca* is important as a weed of potato in Iran. Using Gompertz and Weibull soil thermal time the lag time and 50% of *P.aegyptiaca* attachments occurred after 613.75 (124.8) and 999.49 (5.98) TT respectively.]

Hoyt, H.M., Hornsby, W., Huang ChingHsun, Jacobs, J.J. and Mathiasen, R.L. 2017. Dwarf mistletoe control on the Mescalero Apache Indian Reservation, New Mexico. Journal of Forestry 115(5): 379-384. [Locally developed management guidelines were used to treat ponderosa pine moderately to severely infected by *Arceuthobium vaginatum* ssp. *cvryptopodum.* This involved salvaging merchantable timber and then slashing remaining trees to .2 ft tall. Results after 9 years were excellent.]

Hozumi, A., Bera, S., Fujiwara, D., Obayashi, T. and Yokoyama, R. 2017. Arabinogalactan proteins accumulate in the cell walls of searching hyphae of the stem parasitic plants, *Cuscuta campestris* and *Cuscuta japonica*. Plant and Cell Physiology 58(11): 1868–1877. [The spatial distribution patterns of cell wall components at a parasitic interface using parasite–host complexes of *C. campestris–Arabidopsis thaliana* and *C. japonica–Glycine max* were examined, focusing on arabinogalactan proteins (AGPs), because AGPs accumulate in the cell walls of searching hyphae of both *C. campestris* and *C. japonica.* The results suggest that AGPs are involved in hyphal elongation and adhesion to host cells, and in the adhesion between the epidermal tissues of *Cuscuta* and its host.]

Hu Bin, Sakakibara, H., Takebayashi, Y., Peters, F.S., Schumacher, J., Eiblmeier, M., Arab, L., Kreuzwieser, J., Polle, A. and Rennenberg, H. 2017. Mistletoe infestation mediates alteration of the phytohormone profile and anti-oxidative metabolism in bark and wood of its host *Pinus sylvestris*. Tree Physiology 37(5): 676-691. [Noting that *V. album* causes widespread damage to *P. sylvestris* in Central European forests. The study details the the ways in which infection by the parasite affects both the host's anti-oxidative defense system and the phytohormone profile.]

Huanguli, N., Saifuding, A., Naerhulan, Z. and Ayiguli, M. 2017. (Hypoglycemic effects of different extracts of *Orobanche coerulescens* Steph.) (in Chinese) Journal of Food Safety and Quality 8(8): 3080-3084. [Confirming hypoglycemic effects of *O. coerulescens* in diabetic mice.]

*Huber, R., Schlodder, D., Effertz, C., Rieger, S. and Tröger, W. 2017. Safety of intravenously applied mistletoe extract - results from a phase I dose escalation study in patients with advanced cancer. BMC Complementary and Alternative Medicine 17(465):(18 September 2017). (https://bmccomplementalternmed.biomedcentral.com/track/pdf/10.1186/s12906-017-1971-1) [Concluding that weekly infusions of 2000 mg of an aqueous extract of *Viscum album* were tolerated and can be used in further studies but had a risk of causing allergic reactions and fever.]

*Ishida, J.K., Yoshida, S. and Shirasu, K. 2017. Quinone oxidoreductase 2 is involved in haustorium development of the parasitic plant *Phtheirospermum japonicum.* Plant Signalling and Behaviour 12(7): e1319029. (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5586360/) [Showing that while quinine oxidoreductase 1 (QR 1) is involved in signal transduction leading to haustorium induction in *Triphysaria versicolor*, QR 2 has the equivalent function in *P. japonicum.*]

*Ishida, J.K., Yoshida, S. and Shirasu, K. 2017. Quinone oxidoreductase 2 is involved in haustorium development of the parasitic plant *Phtheirospermum japonicum.* Plant Signaling and Behavior 12(7): e1319029. (http://www.tandfonline.com/doi/pdf/10.1080/15592324.2017.1319029)

Ito, S., Yamagami, D., Umehara, M., Hanada, A., Yoshida, S., Sasaki, Y., Yajima, S., Kyozuka, J., Ueguchi-Tanaka, M., Matsuoka, M., Shirasu, K., Yamaguchi, S. and Asami, T. 2017. Regulation of strigolactone biosynthesis by gibberellin signaling. Plant Physiology 174(2): 1250-1259. [The cross talk between gibberellin (GA) and strigolactones (SLs) was studied in rice . The regulation of SL biosynthesis by GA was found to be dependent on the GA receptor GID1 and F-box protein GID2. GA treatment also reduced the infection of rice plants by *Striga hermonthica*. These data suggest that GA could be used to control parasitic weed infections.]

*Kaitera, J., Hiltunen, R. and Hantula, J. 2017. *Nasa*, *Nemesia* and *Euphrasia*: new alternate hosts of *Cronartium* spp. Forest Pathology 47(2): e12306. [Confirming *E. stricta* and *Bartsia alpina* as alternate hosts for the rust fungus *C. flaccidum. E. stricta* was also a host for *C. ribicola*.]

Kaitera, J., Hiltunen, R., Kauppila, T. and Hantula, J. 2017. Five plant families support natural sporulation of *Cronartium ribicola* and *C. flaccidum* in Finland. European Journal of Plant Pathology 149(2): 367-383. [*C. flaccidum* sporulated on *Melampyrum sylvaticum* and a *Pedicularis* sp. as well as *Euphrasia stricta* var. *stricta*, as noted above.]

Kewal Kumar, Manhas, R.K. and Sharma, Y.P. 2016. Parasitism of *Orobanche alba* on *Thymus serpyllum*: a new report from India. Indian Forester 142(7): 704-705. [No abstract available.]

*Kim TaeHoon, Hatano, T., Okamoto, K., Yoshida, T., Kanzaki, H., Arita, M. and Ito, H. 2017. Antifungal and ichthyotoxic sesquiterpenoids from *Santalum album* heartwood. Molecules 22(7): 1139 . (http://www.mdpi.com/1420-3049/22/7/1139/htm) [Finding that α-santalol is toxic to fish and together with inulavosin to the dermatophytic fungus, *Trichophyton rubrum*: α-santalol was further revealed to be a potent antimitotic agent with potential as a therapeutic agent for cancers as well as fungal skin infections.]

Klutsch, J.G., Najar, A., Sherwood, P., Bonello, P. and Erbilgin, N. 2017. A native parasitic plant systemically induces resistance in jack pine to a fungal symbiont of invasive mountain pine beetle. Journal of Chemical Ecology 43(5): 506-518. [Describing complex interactions between *Pinus banksiana* and *Arceuthobium americanum* resulting in reduction of the fungus *Grosmannia clavigera* and corresponding reduction in pine beetle attack.]

Kochieva, E.Z., Filyushin, M.A., Beletsky, A.V., Ravin, N.V. and Skryabin, K.G. 2017. Identification and expression analysis of chitinase genes in parasitic plant *Monotropa hypopitys*. Doklady Biochemistry and Biophysics 473(1): 111-113.

Krishnakumar, N., Parthiban, K.T., Jayamani, P., Revathi, R. and Umeshkanna, S. 2017. Genetic variability of growth parameters among different progenies of *Santalum album* L. Journal of the Indian Society of Coastal Agricultural Research 35(1): 56-63. [Identifying progeny FCRISA 18 as superior to 29 others in growth characteristics and suggesting it could be useful in a breeding programme.]

*Kruh, L.I., Lahav, T., Abu-Nassar, J., Achdari, G., Salami, R., Freilich, S. and Aly, R. 2017. Host-parasite-bacteria triangle: the microbiome of the parasitic weed *Phelipanche aegyptiaca* and tomato-*Solanum lycopersicum* (Mill.) as a host. Frontiers in Plant Science 8(March): 269. (https://www.frontiersin.org/articles/10.3389/fpls.2017.00269/full) [Showing that the endophyte communities of *P. aegyptiaca* were significantly different from that of non-parasitized tomato root, but no significant differences were observed between the parasite and its host after parasitization, suggesting the occurrence of bacterial exchange between these two plants. Also the potentially valuable finding that a *Pseudomonas* strain *PhelS10*, originating from the tomato roots, suppressed approximately 80% of *P. aegyptiaca* seed germination and significantly reduced *P. aegyptiaca* parasitism.]

*Lachezar, A., Nikolov, L. A., and Davis, C. C. 2017. The big, the bad, and the beautiful: Biology of the world's largest flowers. Journal of Systematics and Evolution 55(Special issue: Evolution, Development, and Genetics of Floral Display—Form, Size, and Arrangement): 516–524. [A very nice review of the morphology, anatomy, flower development, life history, pollination ecology, and phylogeny of the 'Queen of parasites' and relatives (Rafflesiaceae *s. str.*).]

*Latvis, M., Jacobs, S.J., Mortimer, S.M.E., Richards, M., Blischak, P.D., Mathews, S. and Tank, D.C. 2017. Primers for *Castilleja* and their utility across Orobanchaceae: II. Single-copy nuclear loci. Applications in Plant Sciences 5(9): 1700038. (http://www.bioone.org/doi/10.3732/apps.1700038) [From low-coverage genomes of 3 *Castilleja* taxa, 87 primers were designed for the single-copy conserved ortholog set (COSII) and the pentatricopeptide repeat (PPR) gene families, 27of which had broader utility within Orobanchaceae]

*Latvis, M., Mortimer, S.M.E., Morales-Briones, D.F., Torpey, S., Uribe-Convers, S., Jacobs, S.J., Mathews, S. and Tank, D.C. 2017. Primers for *Castilleja* and their utility across Orobanchaceae: I. chloroplast primers. Applications in Plant Sciences 5(9): 1700020. (http://www.bioone.org/doi/10.3732/apps.1700020) [76 primer pairs to variable regions of the plastome were developed for *Castilleja* but also showed utility across other major clades in Orobanchaceae.]

Li BaoDing. 2016. Study on flavor development of chicken stewed with *Cistanche deserticola* Ma. China Condiment 42(4): 96-98. [Chicken stewed with *C. deserticola* is a nutritious dish with unique flavour, claimed to have additional benefits of including anti-aging, enhancing immunity and cardiovascular system protection.]

Li Yang, Peng Ying, Wang MengYue, Tu PengFei and Li XiaoBo. 2017. Human gastrointestinal metabolism of the Cistanches Herba water extract in vitro: elucidation of the metabolic profile based on comprehensive metabolite identification in gastric juice, intestinal juice, human intestinal bacteria, and intestinal microsomes. Journal of Agricultural and Food Chemistry 65(34): 7447-7456 . [Iderntifying a wide range of the meatbolites from *Cistanche deserticola* and *C. tubulosa* formed in the human gastric environment.]

Lin WeiYong, Yao Chun, Cheng, J., Kao ShungTe, Tsai FuuJen and Liu HsinPing. 2017. Molecular pathways related to the longevity promotion and cognitive improvement of *Cistanche tubulosa* in *Drosophila*. Phytomedicine 26: 37-44. [Concluding that extracts of *C. tubulosa*, used in Chinese medicine to improve sexual function and treat kidney dysfunction, can contribute to slowing aging and alleviating memory loss in *Drosophila.* Rapamycin and Notch networks, have been identified as causing these pharmacological effects and alterations in the gene expression of glutamate receptors.]

Lin Yun, Bi HaiYan, Yang ZhiRong, Luo TianLin, He ShanShan, Chen YaLi, Jing Xuan, Yun

YingXia, Wang MingQiong and Lin Qi. 2017. (Lectotypifications of some names in Sympetalae from China -III. Scrophulariaceae, Bignoniaceae and Gesneriaceae.) (in Chinese) Acta Botanica Boreali-Occidentalia Sinica 37(5): 1042-1046. [Recording syntypes of *Pedicularis alaschanica*, *P. chinensis*., *P. recurva*, *P. rhodotricha*., *P. rudis* and, *P. torta*.]

Linares-Holguín O.O., Sánchez-Peña P., Molina-Freaner F. 2016. (Genetic diversity of the chloroplast (TrnL-F) region among populations of *Pholisma culiacanum* Y.) (in Spanish) Agrociencia 50:799-809. [Analysis of trnL-F sequences using 70 samples from 7 populations of this species revealed 11 haplotypes. Within-population variation was 86.5% and between was 13.5% with no significant relationship between genetic and geographic distance.]

*Logacheva, M.D., Schelkunov, M.I., Shtratnikova, V.Y., Matveeva, M. and Penin, A.A. 2016. Comparative analysis of plastid genomes of non-photosynthetic Ericaceae and their photosynthetic relatives. Scientific Reports 6(30042): srep30042. (http://www.nature.com/articles/srep30042) [The plastomes of the nonphotosynthetic *Monotropa uniflora* (46 kbp) and *Hypopitys monotropa* (35 kbp) were determined as was the photosynthetic *Pyrola rotundifolia* (169 kbp).]

Long Cai, Fan RongHua. Zhang QiLi, Zhang ZhaoYan, Wang DanLin, Xia YingYing, Ma YuYing, Yu ZhiGuo and Zhao YunLi. 2017. Simultaneous identification and quantification of the common compounds of *Viscum coloratum* and its corresponding host plants by ultra-high performance liquid chromatography with quadrupole time-of-flight tandem mass spectrometry and triple quadrupole mass spectrometry. Journal of Chromatography, B 2017: 176-184. [The title says it all?]

López-Ráez, J.A., Shirasu, K. and Foo, E. 2017. Strigolactones in plant interactions with beneficial and detrimental organisms: the Yin and Yang. Trends in Plant Science 22(6):527-537. [A review with emphasis on interactions with microorganisms.]

Lorenz, P., Knittel, D.N., Conrad, J., Lotter, E.M., Heilmann, J., Stintzing, F.C. and Kammerer, D.R. 2016. 1-Acetyl-3-[(3*r*)-hydroxyfatty acyl]glycerols: lipid compounds from *Euphrasia rostkoviana* Hayne and *E. tetraquetra* (Bréb.) Arrond. Chemistry & Biodiversity 13(5): 602-612. [Five new homologous acetylated acylglycerols of 3-hydroxyfatty acids, named euphrasianins A-E, were characterized from *E. rostkoviana.* Two of these also occurred in *E. tetraquetra*.]

Low, Y.W., Ariffin, A.K.M., Joffre, A.A. and Ain, D.D. 2017. Novitates Bruneienses, 8. *Macrosolen brunsing* (Loranthaceae), a new hemiparasitic shrub from Brunei Darussalam. Gardens' Bulletin (Singapore) 69(1): 67-73. (https://www.researchgate.net/publication/317091684_Novitates_Bruneienses_8_Macrosolen_brunsing_Loranthaceae_a_new_hemiparasitic_shrub_from_Brunei_Darussalam) [*M. brunsing* growing on a *Hydnocarpus* sp. (*Achariaceae*) differs from other *Macrosolen* spp. in its very narrow (1-2mm wide) leaves.]

Lumba, S., Holbrook-Smith, D. McCourt.P. 2017. The perception of strigolactones in vascular plants. Nature Chemical Biology 13(6): 599-606. [Reviewing information on strigolactone signaling which is leading to insights into parasitic plant infections, specifically focusing on how the development of chemical probes can be used in combination with model plant systems to dissect strigolactone's perception in the parasitic plant *Striga hermonthica*.]

Lumba, S., Subha, A. and McCourt, P. 2017. Found in translation: applying lessons from model systems to strigolactone signaling in parasitic plants. Trends in Biochemical Sciences 42(7): 556-565. [Two approaches are presented to understand how parasitic plants respond to host-derived SLs. The first involves extrapolating information on SLs from model genetic systems to dissect their roles in parasitic plants. The second uses chemicals to probe SL signaling directly in the parasite *Striga hermonthica*. These approaches indicate that parasitic plants have co-opted a family of α/β hydrolases to perceive SLs.]

*McGee, E. and Vaughn, S. 2017. Of lemurs and louse flies: the biogeochemical and biotic effects of forest disturbance on *Propithecus edwardsi* and its obligate ectoparasite *Allobosca crassipes* in Ranomafana National Park, southeastern Madagascar. American Journal of Primatology 79(8): e22676. (http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1098-2345) [Noting that *Bakerella clavata* (Loranthaceae) is an importanrt food source for the lemur *P. edwardsi* in Madagascar.]

Marciniuk, P.,Marciniuk, J.;Sychut-Czapla, E.,Oklejewicz, K. and Wolanin, M. 2016. (Meadows of the *Molinietalia* order as a refugium of rare plant species in the Nadbużański Landscape Park (E Poland).) (in Polish) Fragmenta Floristica et Geobotanica Polonica 23(1): 73-81. [*Melampyrum cristatum* and *Pedicularis palustris* among species threatened by changed land usage.]

Mariko, M., Sarr, S.O., Diop, A., Modi, I.A., Dackouo, B. and Diop, Y.M. 2016. Antioxidant activity study and total phenolic determination of leaf extracts of *Ximenia americana* L. (Olacaceae) an antitumor plant used traditionally in Mali. Journal of Applied Biosciences 106: 10258-10265. [The results suggest significant anti-oxidant activity in extracts of

Ximenia americana, of potential as anti-cancer agents.]

Marinov-Serafimov, P., Golubinova, I. and Marinova, D. 2017. Allelopathic tolerance of alfalfa (*Medicago sativa* L.) varieties to dodder (*Cuscuta epithymum* L.). Pesticidi i Fitomedicina 32(1): 51-59. [Showing apparent allelopathic effects of aqueous extracts of dried *C. epithymum* on germination of *M. sativa*. Some varieties of *M. sativa* less sensitive than others. Practical relevance not explained.]

Marques, F.M., da Costa, M.R., Vittorazzi, C., Gramma, L de S.dos S., Barth, T., de Andrade, T.U., Endringer, D.C., Scherer, R. and Fronza, M. 2017. *In vitro* and *in vivo* anti-inflammatory effects of *Struthanthus vulgaris*. Planta Medica 83(9): 770-777. [*S. vulgaris* is probably the most common medicinal mistletoe plant in Brazil, and has been used in folk medicine as an anti-inflammatory agent and for cleaning skin wounds. The study confirmed that an ethanol leaf extract exhibited prominent anti-inflammatory effects, endorsing its usefulness as a medicinal therapy against inflammatory diseases.]

Matković, A., Sarić-Krsmanović, M., Božić, D., Saulić, M. and Vrbničanin, S. 2017. Effect of *Bacillus licheniformis* on seed germination of different weed species [Conference poster]. 6e COMAPPI, Conférence sur les Moyens Alternatifs de Protection pour une Production Intégrée, Lille, France, 21-23 mars 2017: 238-243. (https://www.cabdirect.org/cabdirect/FullTextPDF/2017/20173254494.pdf) [*B. licheniformis* in this study completely inhibited the germination of *Cuscuta campestris*.]

Maza, H., Mkounga, P., Fenkam, S.L., Sado, S.K., Ishikawa, H., Nishino, H. and Nkengfack, E.A. 2017. Triterpenoids from seeds of *Tapinanthus bangwensis*. Phytochemistry Letters 19: 23-29. [Identifying 7 new compounds from *T. bangwensis* and describing activity of some of them against *Escherichia coli*, *Staphylococus aureus*, *Salmonella typhi* and *Candida albicans*.]

Medina M.N.D. and Cruz R.D. 2016. Partial mitochondrial DNA barcode of *Rafflesia mira* Fernando & Ong, 2005 (syn. *Rafflesia magnifica* Madulid, Tandang, Agoo, 2005) using matR with phylogenetic analysis of selected *Rafflesia* species in the world. International Journal of Environment, Agriculture and Biotechnology (IJEAB) 1:374-380. [Partial matR sequences from three accessions of *R. mira* were analyzed along with 15 other *Rafflesia* species. Weaknesses include the use of Neighbor-Joining instead of model-based phylogenetic methods (that have been proven to be superior with these holoparasites) and no other taxa within or outside Rafflesiaceae were included that would allow the root of the tree to be inferred.]

Mengesha, W.A., Menkir, A., Unakchukwu, N., Meseka, S., Farinola, A., Girma, G. and Gedil, M. 2017. Genetic diversity of tropical maize inbred lines combining resistance to *Striga hermonthica* with drought tolerance using SNP markers. Plant Breeding 136(3): 338-343. [Results from a study of 128 drought and *Striga*-resistant lines showed four distinct groups consistent with the pedigrees of the lines.]

*Miao Ning Zhang Lei, Li MaoPing, Fan LiQiang and Mao KangShan. 2017. Development of EST-SSR markers for *Taxillus nigrans* (Loranthaceae) in southwestern China using next-generation sequencing. Applications in Plant Sciences 5(8): 1700010. (http://www.bioone.org/doi/pdf/10.3732/apps.1700010) [Reporting the development of markers which will serve as a basis for studies to assess the extent and pattern of distribution of genetic variation in *T. nigrans*, and for use in conservation genetic, ecological, and evolutionary studies of the genus *Taxillus*, a group of plant species of importance in Chinese traditional medicine.]

*MingLang, RyiYu, YongqingMa, WeiZhang and McErlean, C.S.P. 2017. Extracts from cotton over the whole growing season induce *Orobanche cumana* (sunflower broomrape) germination with significant cultivar interactions. Frontiers of Agricultural Science and Engineering 4(2): 228-236. (http://engineering.cae.cn/fase/EN/10.15302/J-FASE-2017150#1) [Confirming that extracts and exudates from cotton roots induced germination of *O. cumana* but displayed some significant cultivar interactions.]

Miyao, G. 2017. Egyptian broomrape eradication effort in California: a progress report on the joint effort of regulators, university, tomato growers and processors. Acta Horticulturae 1159: 139-142. [Following its first detection in 2014, the localised infestation of *Phelipanche aegyptiaca* has been treated with glyphosate, hand pulling, flaming and fumigation. No recurrence is apparent at the time of this report.]

*Moniodis, J., Jones, C.G., Renton, M., Plummer, J.A., Barbour, E.L., Ghisalberti, E.L. and Bohlmann, J. 2017. Sesquiterpene variation in west Australian sandalwood (*Santalum spicatum*). Molecules 22(6): 940. (http://www.mdpi.com/1420-3049/22/6/940/htm) [Studying the varied sesquiterpene content of extracts of *S. spicatum* from the arid northern and southeastern and semi-arid southwestern regions of West Australia. Total content was generally the same but populations from the nort and south-west contained the highest levels of desirable α- and β-santalol, while southeastern populations were higher in undesirable *E,E*-farnesol and α-bisabolol.]

Moussa, T.A.A., Al-Zahrani, H.S., Kadasa, N.M.S., Ahmed, S.A., de Hoog, G.S. and Al-Hatmi, A.M.S. 2017. Two new species of the *Fusarium fujikuroi* species complex isolated from the natural environment. Antonie van Leeuwenhoek 110(6): 819-832. [Molecular analyses confirm two new species *Fusarium sudanense* and *F. terricola* in the *F. fujikuroi* species complex. One of these was isolated from *Striga herminthica* in Sudan but not clear which from the abstract.]

Mpika, J., Wahounou, P.J., Kossonou, K.A., Soumahin, E.F., Konan, E., Gnagne, M. and Obouayeba, S. 2017. Chemical control of *Phragmanthera capitata* in plantations of three clones (GT 1, PB 235 and PB 217) of *Hevea brasiliensis* (Euphorbiaceae) in Côte d'Ivoire. Journal of Animal and Plant Sciences (JAPS) 32(3): 5212-5222. [Noting that *P. capitata* may reduce rubber yields by 10% in Côte d'Ivoire. 10 ml glyphosate injected per tree at the base of the trunk provided 65 to 86% mortality of *P. capitata* and had no negative effect on rubber yield.]

Mudavath, C.N., Kailas, J.G., Salamma Sugali, Devender Ravula, Ramakrishna Hari and Boyina, R.P.R. 2017. The non-arboreal diversity of the Andaman Islands, India, based on pollen analysis. Palynology 41(4): 41-461. [Among 118 species studied, only *Macrosolen cochinchinensis* has oblate pollen grains.]

Mulsow, K., Delebinski, C., Seifert, G. and Melzig, M.F. 2017. (Quantification of the mistletoe lectin I from pharmaceutical products.) (in Gerrman) Zeitschrift für Phytotherapie 38(4): 148-151. [Using two different ELISA (enzyme-linked immunosorbent assay) analyses to show that the levels of lectin I differed among the five comercial preparations available in Germany.]

Mursidawati, S. 2017. *Ex situ* conservation of *Rafflesia patma* (Rafflesiaceae) in Bogor Botanical Gardens (Indonesia). Nature Conservation Research 2(2): 90-91. [Describing means of cultivating *R. patna* in the Bogor Botanic Gardens, including the use of grafting, and noting the possible importance of such cultivation for preservation of the species in the face of habitat loss.]

*Nativ, N., Hacham, Y., Hershenhorn, J., Dor, E. and Amir, R. 2017. Metabolic investigation of *Phelipanche aegyptiaca* reveals significant changes during developmental stages and in its different organs. Frontiers in Plant Science 8(April): 491. (https://www.frontiersin.org/articles/10.3389/fpls.2017.00491/full) [The detailed results on a wide range of metabolites contribute to our knowledge of the metabolic behavior of parasites such as *P. aegypiaca* that rely on their host for their basic nutrients.]

Neondo, J.O., Alakonya, A.E. and Kasili, R.W. 2017. Screening for potential *Striga hermonthica* fungal and bacterial biocontrol agents from suppressive soils in western Kenya. BioControl 62(5): 705-717. [Bioactive bacterial isolates belonged to *Bacillus*, *Streptomyces* and *Rhizobium* genera. Isolate KY041696 (unidentified?) recorded high antibiosis, enzymatic and seed decay values. No fungal isolate caused *S. hermonthica* seed decay.]

Nickrent D.L. 2017. Status of the genera *Colpoon*, *Osyris* and *Rhoiacarpos* in South Africa. Bothalia: African Biodiversity & Conservation 47(1):1-7. [Comparative morphology and phylogenetics were used to support the position that these three genera are distinct].

Niklfeld, H. 2016. (New floristic records from Austria (170-235).) (in German) Neilreichia 8: 181-238. [*Orobanche alsatica* subsp. *libanotidis* (= *O. bartlingii*) is newly recorded in Upper Austria.]

Nimmy Kumar, Subhankar Biswas, Shrungeswara, A.H., Mallik, S.B., Viji, M.H., Mathew, J.E., Jesil Mathew, Nandakumar, K. and Richard Lobo. 2017. Pinocembrin enriched fraction of *Elytranthe parasitica* (L.) Danser induces apoptosis in HCT 116 colorectal cancer cells. Journal of Infection and Chemotherapy 23(6): 354-359.

Njekete, J. Midzi, J., Ncube. B. and Madanzi, T. 2017. Response of *Alectra vogelii* Benth to different crop root exudates. International Journal of Plant & Soil Science, 15(4):1-12. [Groundnut and pearl millet genotypes caused effective suicidal germination of *A. vogelii* seeds and could be used as trap crops. Maize and sorghum did not effectively support germination or attachment.]

Nobis, M. and at least 25 others. 2017. Contribution to the flora of Asian and European countries: new national and regional vascular plant records, 6. Botany Letters 164(1): 23-45. [Reporting new records for *Orobanche grenieri* from Kyrgyzstan, *Orobanche baumanniorum* and *Orobanche kotschyi* from Turkey, and *Orobanche bartlingii* from Georgia.]

*Oancea, F.. Georgescu, E., Matusova, R., Georgescu, F., Nicolescu, A., Raut, I., Jecu, M.L., Vladulescu, M.C., Vladulescu, L. and Deleanu, C. 2017. New strigolactone mimics as exogenous signals for rhizosphere organisms. Molecules 22(6): 961. (http://www.mdpi.com/1420-3049/22/6/961/htm) [hree strigolactone mimics, pyrimidylphenoxy-, benzoisoquinolinedionyloxy-, and naphthoquinolinolyoxy-D ring, were synthesized and examined for their activities on seed germination in different root parasites and radial growth and hyphal branching in pathogenic fungi. These mimics exhibited low to moderate stimulation effects on parasite seed germination and different potencies on growth and hyphal branching of pathogenic fungi.]

*Okubamichael, D.Y., Griffiths, M.E. and Ward, D. 2016. Host specificity in parasitic plants - perspectives from mistletoes. AoB Plants 8: plw069. (https://academic.oup.com/aobpla/article/2669803/Host-specificity-in-parasitic-plants-perspectives) [A valuable, detailed review of the many factors influencing host specificity in mistletoes based largely on South African species, with examples such as *Viscum rotundifolium* a generalist mistletoe species that parasitizes at least six tree species, *Agelanthus natalitius*, which has a limited number of host species and predominantly parasitizes *Acacia caffra. Viscum combretum* mainly parasitizes *Combretum erythrophyllum* and rarely is found on *Dombeya rotundifolia* while *Tapinanthus rubromarginatus* parasitizes only *Protea caffra.*]

Ollerton, J., Rouquette, J.R. and Breeze, T.D. 2016. Insect pollinators boost the market price of culturally important crops: holly, mistletoe and the spirit of Christmas. Journal of Pollination Ecology 19: 93-97. [Emphasising the importance of pollination in the sale of *Viscum album*; the price of mistletoe is tripled by the presence of berries. No mention of specific pollinators in the abstract.]

*Olsen, S. and Krause, K. 2016. Activity of xyloglucan endotransglucosylases/hydrolases suggests a role during host invasion by the parasitic plant *Cuscuta reflexa.* PLoS ONE 12(4): e0176754. (http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0176754) [Showing that the level of xyloglucan endotransglucosylation (XET) activity was found to peak at the penetrating stage of *Cuscuta reflexa* on its host *Pelargonium zonale.* A known inhibitor of XET reduced the number of haustorial invasions.]

Omeje, E.O., Nworu, S.C, Osadebe, P.O., Onugwu, L., Maurya, R., Okafor, S.N. and Proksch, P. 2017. In-vitro anti-inflammatory activities of 3-methoxy quercetin isolated from Nigerian mistletoe parasitic on *Garcinia kola* Heckel, Clusiaceae. Tropical Journal of Pharmaceutical Research 16(5): 1059-1067. [The results suggest a potent anti-inflammatory activity of 3-methoxy quercetin from '*L. micranthus'* (possibly a misspelling of *L. micrantherus* (= *Englerina gabonensis*), and suggest its use as a potential alternative therapy for inflammation and related diseases.]

Omoigui, L.O., Kamara, A.Y., Moukoumbi, Y.D., Ogunkanmi, L.A. and Timko, M.P. 2017. Breeding cowpea for resistance to *Striga gesnerioides* in the Nigerian dry savannas using marker-assisted selection. Plant Breeding 136(3): 393-399. [The *Striga* resistance gene from the donor parent IT97K-499-35 was introduced into an elite farmer preferred cowpea cultivar 'Borno Brown'. A number of desirable improved lines were selected, immune to *Striga,* and having local genetic background with higher yield than those of their parents and standard varieties.]

Ongachi, W., Onwonga, R.;,Nyanganga, H. and Okry, F. 2016. Comparative analysis of Video Mediated Learning and Farmer Field School approach on adoption of *Striga* control technologies in Western Kenya. International Journal of Agricultural Extension 5(1): 1-10 . [Results indicated that Video Mediated Learning alone could be better than FFS in promoting *Striga*-control technologies, but best results can be expected from a combination of video and FFS as the two approaches complement each other.]

Orlemann, A., Flinders, S.H. and Allphin, L. 2017. The discovery of Great Basin Bristlecone Pine, *Pinus longaeva*, in the Tushar Mountains of the Fishlake National Forest in Central Utah, USA. Western North American Naturalist 77(1): 111-117. [Noting that the new-found *P. lonaeva* is affected, but not threatened, by an unspecified *Arceuthobium* sp.]

*Ortiz-Bustos, C.M., Pérez-Bueno, M.L., Barón, M. and Molinero-Ruiz, L. 2017. Use of blue-green fluorescence and thermal imaging in the early detection of sunflower infection by the root parasitic weed *Orobanche cumana* Wallr. Frontiers in Plant Science 8(May): 833. (https://www.frontiersin.org/articles/10.3389/fpls.2017.00833/full) [Infection by *O. cumana* caused a consistent reduction in blue-green fluorescence in the first 2-3 weeks of infection and could be used as an aid to screening breeding material.]

*Otto, R. and Verloove, F. 2016. New xenophytes from La Palma (Canary Islands, Spain), with emphasis on naturalized and (potentially) invasive species. Collectanea Botanica 35: pp.E001. (*Phelipanche nana* newly recorded on La Palma. Host not indicated.]

Parker, T.J., Chambers, C.L. and Mathiasen, R.L. 2017. Dwarf mistletoe and breeding bird abundance in ponderosa pine forests. Western North American Naturalist 77(1): 40-50. [Finding that the density of breeding birds was not well correlated with density of *Arceuthobium vaginatum* but rather with 'snag' density, snags being a result of past rather than current parasite infection.]

Perronne, R., Gibot-Leclerc, S., Dessaint, F., Reibel, C. and le Corre, V. 2016. (Differences in the germination abilities of two pathovars of branched broomrape on Brassicaceae and Fabaceae hosts.) (in French). In: Proceedings, 23e Conférence du COLUMA. Journées Internationales sur la Lutte contre les Mauvaises Herbes, Dijon, France, 6-8 décembre 2016: 48-57. (https://www.cabdirect.org/cabdirect/FullTextPDF/2017/20173254403.pdf) [Laboratory study comparing the germination of hemp and rape-seed pathovars of *Phelipanche ramosa* by 25 crop and weed species. Showing little difference between pathovars and wide differences between host species, the species causing highest germination (ca. 90%) being *Lotus corniculatus,* thus of potential interest as a trap crop.]

Pointurier, O., Gibot-Leclerc, S., Moreau, D. and Colbach, N. 2016. Modelling cropping system effects on branched broomrape dynamics in interaction with weeds [Conference poster]. 23e Conférence du COLUMA. Journées Internationales sur la Lutte contre les Mauvaises Herbes, Dijon, France, 6-8 décembre 2016. (https://www.cabdirect.org/cabdirect/FullTextPDF/2017/20173254414.pdf) [Using a model PHERASYS to study the effects of cropping systems on *Phelipanche ramosa* dynamics in interaction with weeds and crops. This simulated the complete life-cycle of the parasite, from seed dynamics in the soil to seed production. Interactions between the parasite and crops and weeds were characterized at the species level and at the plant scale. The effects of tillage, delayed sowing and catch crops are discussed.].

Punia, S.S., Anil Duhan, Yadav, D.B. and Sindhu, V.K. 2016. Use of herbicides against *Orobanche* in tomato and their residual effect on succeeding crop. Indian Journal of Weed Science 48(4): 404-409. [Noting that *Phelpianche aegyptiaca* is troublesome in tomato in Harayana, Inda and concluding that that post-emergence applications of ethoxysulfuron or sulfosulfuron at 30 and 60 days after transplanting provided 85-90% control without any adverse effect on the current or following crops and with yield increases of 46-58%.]

Queijeiro-Bolaños, M.E., González, E.J., Martorell, C. and Cano-Santana, Z. 2017. Competition and facilitation determine dwarf mistletoe infection dynamics. Journal of Ecology (Oxford) 105(3): 775-785. [Studying complex interactions between *Arceuthobium vaginatum* and *A. globosum* on the host *Pinus hartwegii* in Mexico. Self-limited population growth allowed mistletoe coexistence and intraguild mutualism was important for colonizing new host space.]

Qurashi, Y.A., Ganawa, E.S., Kheiralla, A.F. and Hassabala, A.A. 2017. Application of satellites imagery in detecting and mapping *Striga hermonthica* in a sugar cane field. Advances in Bioresearch 8(82):146-152. [Remote sensing was used to survey intensity of *S. hermonthica* in cane in SE Sudan. Most was detected in field borders. Losses due to *Striga* over 3 seasons was estimated at 150-200 tons over the studied fields.]

*Rabia Naz, Hafsa Ayub, Sajid Nawaz, Zia-ul-Islam, Tayyaba Yasmin, Asghari Bano, Abdul Wakeel, Saqib Zia and Roberts, T.H. 2017. Antimicrobial activity, toxicity and anti-inflammatory potential of methanolic extracts of four ethnomedicinal plant species from Punjab, Pakistan. BMC Complementary and Alternative Medicine 17:302 (8 June 2017). (https://bmccomplementalternmed.biomedcentral.com/track/pdf/10.1186/s12906-017-1815-z) [Extracts of *Cuscuta pedicellata* had high phenolic, flavonoid and flavonol contents and exhibited strong antioxidant potential in scavenging DPPH and hydrogen peroxide. They also inhibited the growth of *Acinetobacter baumannii*, *Staphylococcus aureus*, and *Klebsiella pneumonia* and exhibited high antifungal potential.]

Ragazzi, A. and Moricca, S. 2016. (*Pseudotsuga menziesii*: pathogens introduced and whose introduction is feared.) (in Italian) Georgofili 13(Supplemento 1): 107-126. [Discussing the risks from introduction of Douglas fir into Europe, including that from *Arceuthobium douglasii.*]

Rajan, N.M. and Shanmugam Jayalakshmi. 2017. Predictive species habitat distribution modelling of Indian sandalwood tree using GIS. Polish Journal of Environmental Studies 26(4): 1627-1642. [Concluding that that the toolbox designed in this research is able to give 90.6% accuracy in the resulting maps of *Santalum album* that it produces.]

Rao, V.S. 2018. Principles of Weed Science. 3rd Edition. New Delhi, India: CBS Publishers and Distributors Ltd. 834 pp. [A new updated edition of this comprehensive volume is now available.]

Ratlhatloleng, N.M., Madibela, O.R. and Machete, J.B. 2016. Anthelmintic effects of a diet containing a traditional plant *Viscum verrucosum* on faecal egg count and eosinophils of naturally infected Tswana goats. In Proceedings, 3rd International conference on neglected and underutilized species (NUS): for a food-secure Africa. At Accra, Ghana, 25-27 September 2013: 140-145. [A *V. verrucosum* based diet was as effective as the chemical, valbazen, in reducing faecal egg count, indicating that the use of natural flora may be a beneficial option for low-resource farmers who cannot afford to purchase drugs control internal parasites.]

Razavifar, Z., Karimmojeni, H and Sini, F.G. 2017. Effects of wheat-canola intercropping on *Phelipanche aegyptiaca* parasitism. Journal of Plant Protection Research 57(3): 268-274. (https://www.degruyter.com/downloadpdf/j/jppr.2017.57.issue-3/jppr-2017-0038/jppr-2017-0038.pdf) [A range of wild and cultivated wheat varieties were planted with canola (rapeseed) and *P. aegyptiaca* in pots. There were apparently significant but rather modest reductions in the parasite with some wheat varieties and allelopathy is claimed, but there are no data and no consideration of the possible effects via competition from the wheat on the canola host.]

Rîșnoveanu, L., Joița-Păcureanu, M. and Anton, F.G. 2016. The virulence of broomrape (*Orobanche cumana* Wallr.) in sunflower crop in Braila area, in Romania. Helia 39(6): 189-196. [Noting that *O. cumana* was first recorded in Romania in 1940. This study determined that all races A to F are present in the country and some virulence greater than F, and the situation is changing annually.]

Sá, R. R., Matos, R.A., Silva, V.C., Caldas, J.daC., Sauthier, M.C.daS., dos Santos, W.N.L., Magalhães, H.I.F. and Santos Júnior, A.deF. 2017. Determination of bioactive phenolics in herbal medicines containing *Cynara scolymus*, *Maytenus ilicifolia* Mart ex Reiss and *Ptychopetalum uncinatum* by HPLC-DAD. Microchemical Journal 135: 10-15. [HPLC-DAD found to be reliable for measurement of phenolics in *P. uncinatum* (Olacaceae).]

Sadowski, E.M., Seyfullah, L.J., Wilson, C.A., Calvin, C.L. and Schmidt, A.R. 2017. Diverse early dwarf mistletoes (*Arceuthobium*), ecological keystones of the Eocene Baltic amber biota. American Journal of Botany 104(5): 694-718. [A fascinating study of six fossil species of *Arceuthobium* that includes a meticulous comparison of fossil and extant dwarf mistletoe morphology as well as discussion of evolutionary trends, biogeography and paleoecology.]

Saeedi, M., Babaie, K., Karimpour-Razkenari, E., Vazirian, M., Akbarzadeh, T., Khanavi, M., Hajimahmoodi, M. and Ardekani, M.R.S. 2017. *In vitro* cholinesterase inhibitory activity of some plants used in Iranian Traditional Medicine. Natural Product Research 31(22): 2690-2694. ['*Cuscuta chinensis*' (more likely another species?) included in the study but no results in abstract.]

Sanjay Singh, Verma, A.D. and Ramu Naik. 2017. Study on regeneration of tree species in TFRI Campus Plantations, Jabalpur, Madhya Pradesh. Indian Journal of Tropical Biodiversity 25(1): 20-30. [Recording successful regeneration of the non-native *Santalum album*.]

*Saraj, B.S., Kafaki, S.B., Kiadaliri, H. and Akhavan, R. 2017. (Classification of worldview 2 satellite image by using object-based technique to identifying the infection of Zagros forests by *Loranthus europaeus*.) (in Persian) Iranian Journal of Forest 8(4): e445-Pe457. (http://www.ijf-isaforestry.ir/article_46269_8a70ce07f0a4b9ba3b43de1c44ca22d2.pdf) [Concluding that Random Forest algorithm with 1000 trees was the best for indentifying the various intensities of infection by *L. europaeus* in forests in Zagros, Iran, with a reliability of 85-92%]

Saric-Krsmanovic, M.M., Bozic, D.M., Radivojevic, L.M., Umiljendic, J.S.G. and Vrbnicanin, S.P. 2017. Effect of *Cuscuta campestris* parasitism on the physiological and anatomical changes in untreated and herbicide-treated sugar beet. Journal of Environmental Science and Health B. 52(11): 812-816. [*C. campestris* shown to cause 20-28% reductions in chlorophyll a and b and carotenoids in sugar beet. These reductions were only 2-5% in crop treated with propyzamide, suggesting it as 'an adequate herbicide for control of field dodder at the stage of early infestation.']

Sarić-Krsmanović, M. and Vrbničanin, S. 2017. Field dodder life cycle and interaction with host plants. Pesticides and Phytomedicine (Belgrade) 32(2): 95–103. [A general review, incidentally noting that about 10 *Cuscuta* species occur in Serbia, *Cuscuta campestris* being the most frequent.]

Sato, H.A. and Gonzalez, A.M. 2017. Embryogenesis, endospermogenesis and fruit development in *Lophophytum* (Balanophoraceae): focus on endosperm and embryo initiation. Flora (Jena) 233: 79-89. [Endosperm forms without fertilization and first develops a coenocyte from the polar nuclei followed by the fusion of the endosperm nuclei resulting in a giant (120 X 60 µm) nucleus. Subsequent mitoses produce nuclei of equal dimensions and cytokinesis results in endosperm cells. The endosperm plus the undifferentiated mature embryo form the seed/fruit (achene).]

Sarfaraz Ahmed, Al-Rehaily, A.J., Ahmad, M.S., Yousaf, M., Nur-E-Alam, M., Parvez, M.K., Al-Dosari, M.S., Noman, O.M., Khan, S.I. and Khan, I.A. 2017. Chemical constituents from *Oncocalyx glabratus* and their biological activities. Phytochemistry Letters 20: 128-132. [Describing 3 new flavans from *O. glabratus* (Loranthaceae) in Saudi Arabia, all showing some activity against hepatitis B.]

Sathiyaseelan, A., Shajahan, A., Kalaichelvan, P.T. and Kaviyarasan, V. 2017. Fungal chitosan based nanocomposites sponges - an alternative medicine for wound dressing. International Journal of Biological Macromolecules 104(Part B): 1905-1915. [Chitosan based composites with potential antibacterial property for wound dressings were prepared with *Aloe vera* extract and *Cuscuta reflexa* mediated biosynthesized silver nanoparticles.]

Sayad, E., Boshkar, E. and Gholami, S. 2017. Different role of host and habitat features in determining spatial distribution of mistletoe infection. Forest Ecology and Management 384: 323-330. [*Loranthus europaeus* causes significant damage to forests in western Iran. As part of a programme to understand the potential for its intensification under climate change, the pattern of its infection in tree canopies was studied. It was concluded that it establishes in the middle crown of the host, then develops downward into lower crown.]

Scalon, M.C. and Wright, I.J. 2017. Leaf trait adaptations of xylem-tapping mistletoes and their hosts in sites of contrasting aridity. Plant and Soil 415(1/2): 117-130. [Photosynthetic traits, leaf dark respiration, nutrient concentrations and specific leaf area (SLA) were measured on 42 mistletoe-host species-pairs sampled sampled from five sites in Australia and Brazil that vary widely in aridity. Concluding that the parasites exhibit trait responses and adaptations to site aridity in parallel and to approximately the same extent as their hosts.]

Shayanowako, A.T., Laing, M., Hussein Shimelis and Mwadzingeni, L. 2017. Resistance breeding and biocontrol of *Striga asiatica* (L.) Kuntze in maize: a review. Acta Agriculturae Scandinavica, Section B

- Soil & Plant Science 67(9): 1-11. [Reviewing the methodology of breeding for resistance to *S. asiatica* in South Africa and promoting the use of integrated methods of *Striga* control including the use of *Fusarium oxysporum* f.sp. *strigea*.]

Shchennikova, A.V., Kochieva, E.Z., Beletsky, A.V., Filyushin, M.A., Shulga, O.A., Ravin, N.V. and Skryabin, K.G. 20117. (Identification and characterization of mRNAs of receptor-like kinases MhyGSO1 and MhyGSO2 in flowering parasitic plant *Monotropa hypopitys*.) (in Russian) Vavilovskij Zbreve˜urnal Genetiki i Selekcii / Vavilov Journal of Genetics and Breeding 21(3): 334-340.

Shchennikova, A.V., Shulga, O.A., Kochieva, E.Z., Beletsky, A.V., Filyushin, M.A., Ravin, N.V. and Skryabin, K.G. 2017. (Homeobox genes encoding WOX transcription factors in the flowering parasitic plant *Monotropa hypopitys*.) (in Russian) Vavilovskij Zbreve˜urnal Genetiki i Selekcii / Vavilov Journal of Genetics and Breeding 21(2): 234-240.

Shaheen Faizi, Versiani, M.A., Asma Kanwal and Aneela Naz. 2017. Host-plant effect on the chemical constituents of *Cuscuta reflexa*. Chemistry of Natural Compounds 53(3):540-542. [No abstract available.]

Sobeh, M., Mahmoud, M.F., Abdelfattah, M.A.O., El-Beshbishy, H.A., El-Shazly, A.M. and Wink, M. 2017. Hepatoprotective and hypoglycemic effects of a tannin rich extract from *Ximenia americana* var. *caffra* root. Phytomedicine 33: 36-42. [Results confirm a hepatoprotective potential for the root extract from *X. americana* var. *caffra* It can also mediate an antidiabetic effect by reducing elevated blood glucose and serum lipid peroxides levels and by increasing insulin in STZ-diabetic rats by -107%, -31.1% and +11.3%, respectively.]

Spallek, T., Melnyk, C.W., Wakatake, T., Zhang Jing, Sakamoto, Y., Kiba, T., Yoshida, S., Matsunaga, S., Sakakibara, H. and Shirasu, K. 2017. Interspecies hormonal control of host root morphology by parasitic plants. Proceedings of the National Academy of Sciences of the United States of America 114(20): 5283-5288. [The results demonstrate that the interspecies movement of cytokinin from the parasite, *Phtheirospermum japonicum* modified both host root morphology and fitness. Other microbial and animal plant pathogens use cytokinins during infections, highlighting the central role of this growth hormone during the establishment of plant diseases and revealing a common strategy for parasite infections of plants.]

Spooner, B.M. 2016. Checklist of British galls and gall-causing organisms: 11, vascular plants: preliminary list. Cecidology 32(1): 39-50. [No abstract available but apparently describing galls of Convolvulaceae, Orobanchaceae and Santalaceae in UK.]

*Steinborn, C. and 12 others. 2017. *Viscum album* neutralizes tumor-induced immunosuppression in a human *in vitro* cell model. PLoS ONE 12(7): e0181553. (http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0181553) [Two *V. album* extracts were tested for their effects on the maturation of human dendritic cells and on T cell function using flow cytometry, automated fluorescence microscopy and cytokine bead array assays, leading to their potential mode-of-action as an additive cancer therapy based on immunomodulatory effects.].

*Sun Ting, Renner, S.S., Xu YuXing, Qin Yan, Wu JianQiang and Sun GuiLing. 2016. Two *h*AT transposon genes were transferred from Brassicaceae to broomrapes and are actively expressed in some recipients. Scientific Reports 6: No.30192. (http://www.nature.com/articles/srep30192) [Concluding that the broomrape genera *Phelipanche* and *Orobanche* acquired two related nuclear genes (christened *BO* transposase genes), a new group of the *hAT* superfamily of class II transposons, from Asian Sisymbrieae or a closely related tribe of Brassicaceae, by horizontal gene transfer. The collinearity of the flanking genes, lack of a classic border structure, and low expression levels suggest that *BO* transposase genes cannot transpose in Brassicaceae, whereas they are highly expressed in *P. aegyptiaca*.]

Susatya A, Hidayati SN, Riki S. 2017. *Rafflesia kemumu* (Rafflesiaceae), a new species from Northern Bengkulu, Sumatra, Indonesia. Phytotaxa 326: 211-220. [A new species was named from plants occurring in two populations from the Palak Siring area of West Sumatra. that are sympatric with *R. gadutensis*. This taxon is morphologically very similar to *R. gadutensis* and sympatric with it, thus they may be conspecific (molecular data are needed).]

Suveren, E., Baxter, G.F., Iskİt, A.B. and Turker, A.U. 2017. Cardioprotective effects of *Viscum album* L. subsp. *album* (European misletoe) leaf extracts in myocardial ischemia and reperfusion. Journal of Ethnopharmacology 209: 203-209. [Studying the cardioprotective effectseffects of *V. album* leaf extracts in myocardial ischemia in rats and concluding ischemiaand concluding that *V. album* leaf extracts can mediate nitric oxide-dependent cardioprotection against myocardial injury produced by ischemia/reperfusion insult. The popular use of *V. album* extracts in Turkish folk medicine as a remedy for cardiac diseases is thus justified.]

Swati Srivastava and Ashok Sharma. 2017. Study of microRNA mediated gene regulation in *Striga hermonthica* through *in-silico* approach. Agri Gene 6: 47-53. [Mobile small RNA are reported to move bidrectionally between parasite and host plants. The study was to investigate the miRNA of *S. hermonthica* and miRNA mediated regulation of the host plant *Oryza sativa* genes. Thirteen conserved miRNAs were identified in *S. hermonthica*, and showed homology with their host plants *O. sativa* and *Sorghum bicolor*. Out of the thirteen miRNAs, 12 miRNAs are predicted to regulate 185 target mRNA of *O. sativa*.]

Talabi, A.O., Badu-Apraku, B. and Fakorede, M.A.B. 2017. Genetic variances and relationship among traits of an early maturing maize population under drought-stress and low nitrogen environments. Crop Science 57(2): 681-692. [Studying genetic variances in a maize population which had undergone 4 cycles of selection for drought tolerance, and 4 cycles for resistance to *Striga hermonthica* and concluding that there was insufficient variation for further yield enhancement and there was a need to introgress new sources of favorable alleles for drought-stress and low N tolerance into the population.]

Tan JiaWei and Yan HanJing. 2017. (Pharmacognosy study on *Balanophora subcupularis*.) (in Chinese) Journal of Guangdong Pharmaceutical University 33(2): 181-186.

*Tchingsabe, O., Ngomeni, A.F., Mapongmetsem, P.M., Bekwake, N.A., Noutcheu, R., Dibong, S.D., Tchatat, M. and Fawa, G. 2016. Valorization of non-timber forest products in Mayo-Rey (North Cameroon). Journal of Applied Biosciences 108: 10491-10499. (http://m.elewa.org/Journals/wp-content/uploads/2016/12/2.tchingsabe-5.pdf) [*Ximenia americana* among non-timber species of importance in N. Cameroon.]

Těšitel, J., Mládek, J., Horník, J., Těšitelová, T., Adamec, V. and Tichý, L. 2017. Suppressing competitive dominants and community restoration with native parasitic plants using the hemiparasitic *Rhinanthus alectorolophus* and the dominant grass *Calamagrostis epigejos*. Journal of Applied Ecology 54(5): 1487-1495. [Demonstrating, in the Czech Republic, that *R. alectorolophus* is effective over 2 years, in biological control of the invasive *C. epigejos*, with a great potential to restore infested grassland vegetation.]

*Tilk, M., Tullus, T. and Ots, K. 2017. Effects of environmental factors on the species richness, composition and community horizontal structure of vascular plants in Scots pine forests on fixed sand dunes. Silva Fennica 51(3): article id 6986. (https://silvafennica.fi/article/6986) [*Melampyrum pratense* among the four most frequent species in the understory of *Pinus sylvestris*. The relative importance among species is influenced by elevation and aspect of the, soil nitrogen, potassium and phosphorus, pH, moisture conditions and thickness of the litter. No comment on possible hosts of the parasite.]

Tippe, D.E., Rodenburg, J., Schut, M., van Ast, A., Kayeke, J. and Bastiaans, L. 2017. Farmers' knowledge, use and preferences of parasitic weed management strategies in rain-fed rice production systems. Crop Protection 99: 93-107. [A valuable analysis of farmer reactions to *Rhamphicarpa fistulosa* in lowland rice and *Striga asiatica* in upland rice in Tanzania, and to the available control options. Concluding that the most favourable options for control of *R. fistulosa* were early crop establishment and use of the local variety Supa India. For *S. asiatica* late planting is preferred, requiring a short-duration variety such as NERICA-10 . But emphasising the importance of farmer participation in technology testing and the need for improved credit and input supply.]

Tippe, D.E., Rodenburg, J., van Ast, A. And Bastiaans, L.L. 2017. Delayed or early sowing: timing as parasitic weed control strategy in rice is species and ecosystem dependent. Field Crops Research 214: 14-24. [In general, delaying sowing of dry-land rice in Tanzania resulted in less serious damage from *Striga asiatica*, while for *Rhamphicarpa fistulosa*, early sowing of lowland rice, before soil saturation, was preferable. For upland rice, drought conditions may influence results with *S. asiatica* and require the use of an early-maturing variety.]

Tiribelli, F., Amico, G.C., Sasal, Y. and Morales, J.M. 2017. The effect of spatial context and plant characteristics on fruit removal. Acta Oecologica 82: 69-74. [Studying the factors influencing the success of seed distribution resulting from the dependence of *Tristeryx corymbosous* on the fruit-eating marsupial *Dromiciops gliroides* in temperate S. America.]

Tjiurutue, M.C., Sandler, H.A., Kersch-Becker, M.F., Theis, N. and Adler, L.S. 2017. Gypsy moth herbivory induced volatiles and reduced parasite attachment to cranberry hosts. Oecologia 185(1): 133-145. [Gypsy moth damage significantly reduced subsequent attachment by *Cuscuta* spp. (mainly C. *gronovii*). This effect was associated with increased jasmonic acid levels, total volatile emissions, and the flavonol, quercetin aglycone (see also the senior author's PhD thesis at - http://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1683&context=dissertations_2)]

*Twardziok, M., Meierhofer, D., Börno, S., Timmermann, B., Jäger, S., Boral, S., Eggert, A., Delebinski, C.I. and Seifert, G. 2017. Transcriptomic and proteomic insight into the effects of a defined European mistletoe extract in Ewing sarcoma cells reveals cellular stress responses. BMC Complementary and Alternative Medicine 17(237) (https://bmccomplementalternmed.biomedcentral.com/track/pdf/10.1186/s12906-017-1715-2)

Unachukwu, N.N., Menkir, A., Rabbi, I.Y., Oluoch, M., Muranaka, S., Elzein, A., Odhiambo, G., Farombi, E.O. and Gedil, M. 2017. Genetic diversity and population structure of *Striga hermonthica* populations from Kenya and Nigeria. Weed Research 57(5): 293-302. [Using single nucleotide polymorphisms to confirm the existence of 3 distinct genotypes of *S. hermonthica* in Nigeria. The further distinct genotypes in Kenya included one parasitising rice, distinct from those attacking maize and sorghum. Emphasising the need for local testing of *Striga* control strategies .]

Vali-allah Yousefabadi, Mohammad Taghi Alebrahim, Ahmad Tuobe, Eskandar, Z. and Mohammad Abdollahian-Noghabi. 2017. The effect of seedling transplantation and post-emergence herbicides application on field dodder (*Cuscuta campestris*) control in sugar beet. Romanian Agricultural Research 34(May 2017): 377-384. (http://www.incda-fundulea.ro/rar/nr34/rar34.42.pdf) [In a field experiment in Iran, transplanting sugar beet resulted in greatly reduced infestation by *C. campestris* and 2.5 times increase in beet yield. Transplanting was simultaneous with direct sowing, but age of transplants not indicated.]

*Venditti, A., Frezza, C., Foddai, S., Serafini, M., Nicoletti, M. and Bianco, A. 2017. Chemical traits of hemiparasitism in *Odontites luteus*. Chemistry & Biodiversity 14(4): e1600416. (http://onlinelibrary.wiley.com/wol1/doi/10.1002/cbdv.201600416/abstract) [Identifying a range of monoterpene glycosides in *O. luteus* in Italy, several of which had not previously been reported in Lamiales and had presumably been derived from hosts in such as Oleaceae and Ericaceae.]

***Venezian, A., Dor, E., Achdari, G., Plakhine, D., Smirnov, E. and Hershenhorn, J. 2017. The influence of the plant growth regulator maleic hydrazide on Egyptian broomrape early developmental stages and its control efficacy in tomato under greenhouse and field conditions. Frontiers in Plant Science 8(May): 691. (https://www.frontiersin.org/articles/10.3389/fpls.2017.00691/full) [Laboratory and field experiments confirm the excellent selectivity of maleic hydrazide. Five applications at 100, 200, 400, 700, and 1000 GDD, each at 400 g/ha provide a high degree of control and increased yields, and are now registered and widely used in Israel.]**

Vergara-Barberán, M., Lerma-García, M.J., Nicoletti, M., Simó-Alfonso, E.F., Herrero-Martínez, J.M., Fasoli, E. and Righetti, P.G. 2017. Proteomic fingerprinting of mistletoe (*Viscum album* L.) via combinatorial peptide ligand libraries and mass spectrometry analysis. Journal of Proteomics 164: 52-58. [Towards a better understanding of the role of proteins in the action of *V. album* against cancer, combinatorial peptide ligand libraries (CPLLs) was used to identify a total of 648 non-redundant proteins.]

Versiani, M.A., Asma Kanwal, Shaheen Faizi and Farooq, A.D. 2017. Cytotoxic cardiac glycoside from the parasitic plant *Cuscuta reflexa*. Chemistry of Natural Compounds 53(5): 915-922. [Among 13 thirteen compounds isolated from *C. reflexa,* one, 21-hydroxyodoroside H, had not previously been identified. Three compounds -odoroside H, neritaloside and strospeside, possessed good cytotoxic activity against renal and prostate cancer.]

Wang, J., Gao, J., Wu, Y., Sun, J., Xu, B., Shi, F., Bisht, N.,Xu, J. Wu, N. 2017. Biomass allocation and tradeoffs of *Pedicularis longiflora* Rudolph. at two slope aspects in an alpine meadow of the eastern Tibetan Plateau. Applied Ecology and Environmental Research 15(3): 51-65. [On a southeast slope, *P. longiflora* benefited more in its development and population maintenance, and also showed a relatively greater leaf biomass; while on a SW slope it invested more biomass to reproductive organs.]

*Wang XinHong, Wang XiaoGuang and Guo YuHai. 2017. Rapidly simultaneous determination of six effective components in *Cistanche tubulosa* by near infrared spectroscopy. Molecules 22(5): 843. (http://www.mdpi.com/1420-3049/22/5/843/htm) [Showing that near infrared diffuse reflectance spectroscopy (DRS) could be used for simultaneous determination of echinacoside, verbascoside, mannitol, sucrose, glucose and fructose in ***C.*** *tubulosa* extracts,]

Wang YaJiao, Ji LiJing, Li QiuSheng, Wang LianSheng and Kong LingXiao. 2017. Broomrape bio-control agent Br-2 labeled by red fluorescent protein and its colonization. Journal of Plant Protection 44(4): 664-670. [*Fusarium oxysporium* (Br-2) was converted to exhibit red fluorescence and could then be traced as it infected the epidermis of *O. aegyptiaca* stem one day after inoculation, infected the intercellular of the epidermis and sclerenchymatous cells three days after inoculation, and finally cells of the sclerenchyma and vascular bundle, leading to stem rot after five days. It was restricted to the surface of the tomato root and did not penetrate.]

Wang ZhiQiang, Hwang SeungHwan, Quispe, Y.N.G., Arce, P.H.G. and Lim SoonSung. 2016. Investigation of the antioxidant and aldose reductase inhibitory activities of extracts from Peruvian tea plant infusions. Food Chemistry 231: 222-230. [Confirming that extracts of a *Phoradendron* sp. (unspecified in abstract) can be a potent functional food ingredient as an antioxidant, aldose reductase inhibitor and anti-inflammatory agent.]

Wei JiangChun, Huo XiaoKui, Yu ZhenLong, Tian XiangGe, Deng Sa, Sun ChengPeng, Feng Lei, Wang Chao, Ma XiaoChi and Jia JingMing. 2017. Phenolic acids from *Balanophora involucrata* and their bioactivities. Fitoterapia 121: 129-135. [Studying 15 phenolic acids from *B. involucrata,* including 5 new compounds. Most inhibited α-glucosidase *in vitro*, and showed anti-oxidant activities in the DPPH scavenging assay.]

Westwood, J.H. and G. Kim. 2017. RNA mobility in parasitic plant – host interactions. 2017. RNA Biology 14: 450-455. [A review of RNA exchange between parasitic plants and their hosts, with an emphasis on *Cuscuta*. Host-parasite mobility of RNA is discussed in light of recent progress on RNA trafficking in grafted plant systems]

*Wu ChunYan and Wang XueFeng. 2017. Preliminary research on the identification system for anthracnose and powdery mildew of sandalwood leaf based on image processing.PLoS ONE 12(7): e0181537. (http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0181537) [SVM image segmentation, feature extraction and digital image classification and recognition technology was used successfully to identify and distinguish anthracnose and powdery mildew in leaves of unspecified *Santalum* sp.]

Xi Li, Baohai Hao, Da Pan and Schneeweiss, G.M. 2017. Marker development for phylogenomics: the case of Orobanchaceae, a plant family with contrasting nutritional modes. Frontiers in Plant Science 8(22 November 2017). (https://doi.org/10.3389/fpls.2017.01973) [Phylogenomic approaches, employing next-generation sequencing (NGS) techniques, have revolutionized systematic and evolutionary biology. Target enrichment is an efficient and cost-effective method in phylogenomics and is becoming increasingly popular. Here, a highly flexible bioinformatic pipeline, BaitsFinder, was established to identify putative orthologous single copy genes (SCGs) and to construct bait sequences in a single workflow. Transcriptome data of differing quality available for four Orobanchaceae species were used and, as reference, SCG data from monkeyflower (*Erythranthe guttata*, syn. *Mimulus g*.; 1,915 genes) and tomato (*Solanum lycopersicum*; 391 genes). Based on the results it was suggested that BaitsFinder is expected to be broadly applicable in groups, where only transcriptomes or partial genome data of differing quality are available.]

Xie XiaoNan, Kisugi, T., Yoneyama, K., Nomura, T., Akiyama, K., Uchida, K., Yokota, T., McErlean, C.S.P. and Yoneyama, K. 2017. Methyl zealactonoate, a novel germination stimulant for root parasitic weeds produced by maize. Journal of Pesticide Science 42(2): 58-61. [Describing the isolation of a new strigolactone, methyl zealactonoate, which is highly active on *Striga hermonthica* and *Phelipanche ramosa* but less so on *Orobanche minor*. It is shown to be derived from carlactone in maize.]

Xiao ZhiYe, Hutang GeRan, Wang SiHai, Zhao Neng, Chen ZhongHua, Yuan XiaoLong, Zheng Ke and Wang Yi. 2016. Study on the antimicrobial activity from the crude extracts of roots of *Malania oleifera* Chun et Lee. Journal of West China Forestry Science 46(2): 68-73. [The acetone extract of *M. oleifera* (Ximeniaceae or Olacaceae *s. lat*.) had antibacterial activity against *Bacillus cereus*, *Staphylococcus haemolyticus* and *Streptococcus agalactiae*]

*Yang Chong, Xu Ling, Zhang Na, Islam, F., Song WenJian, Hu LuYang, Liu Dan, Xie XiaoNan and Zhou WeiJun. 2017. ITRAQ-based proteomics of sunflower cultivars differing in resistance to parasitic weed *Orobanche cumana*. Proteomics 17(13/14): 1700009. (http://onlinelibrary.wiley.com/wol1/doi/10.1002/pmic.201700009/full) [Identifying 3500 proteins from a pair of sunflower varieties, susceptible and resistant to *O. cumana.* Resistance was associated with alteration of defence-related proteins involved in recognition of parasites, accumulation of pathogenesis-related proteins, biosynthesis of lignin, and detoxification of toxic metabolites, while susceptibility was associated with decreased abundance of proteins involved in biosynthesis and signaling of plant growth regulators including auxin, gibberellin, brassinosteroid, and ethylene.]

Yang Da, Goldstein, G., Wang Miao, Zhang WeiWei, Wang AiYing, Liu YanYan and Hao GuangYou. 2017. Microenvironment in the canopy rivals the host tree water status in controlling sap flow of a mistletoe species. Tree Physiology 37(4): 501-510. [Showing that the transpiration of *Viscum coloratum* was substantially higher than that of the (unspecified) host during clear days, and that the development of a dense tree canopy functions as a potential mechanism for the reduction of the competitive water use of the parasite.]

Yuliandra, Y., Armenia, A. and Arifin, H. 2017. Antihypertensive and antioxidant activity of *Cassytha filiformis* L.: a correlative study. Asian Pacific Journal of Tropical Biomedicine 7(7): 614-618. [Concluding that a *C. filiformis* extract at 5 mg/kg exhibits good blood pressure lowering effect, not correlated with its antioxidant effect.]

*Zheng JunChao, Chang HongSheng, Ma SuYa, Cheng Dan, Liu YongGang, Liu JingWei and Lu Yi. 2017. (Contrastive research of protect effects of polysaccharide of Tiansi Yin formulas on H_2O_2 injuried SH-SY-5Y cells.) (in Chinese) China Journal of Traditional Chinese Medicine and Pharmacy 32(8): pp.3717-3720. (http://www.zhzyyzz.com/CN/volumn/home.shtml)

[Polysaccharide from *Cuscuta chinensis* can exert a protective effect on H_2O_2 injured SH-SY-5Y cells. This antioxidant effect could be related to increasing expression of PSD-95 and p-ERK.]

HAUSTORIUM 72
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Send material for publication to any of the editors.

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