HAUSTORIUM

Parasitic Plants Newsletter

Official Organ of the International Parasitic Plant Society

July 2006 **Number 49**

IPPS PRESIDENT'S MESSAGE

Dear IPPS Members,

We are pleased to invite you to the 9th **World Congress on Parasitic Plants**, which will be held on **Sunday June 3 to Thursday June 7, 2007** in Charlottesville, Virginia. The congress continues a long tradition of regularly assembling the world's experts on parasitic plants for professional and scientific meetings, which started in 1973 with the first international meeting in Malta. The venue was chosen to be in Virginia, thanks to the long tradition of parasitic plants research in this state, and its significant contribution to the understanding of plant parasitism. Charlottesville is also a very pleasant city, with the historic university that was planned by Thomas Jefferson, third president of the United States, who was not only a gifted architect, but also a scientist.

The Congress will bring together scientists representing a wide spectrum of disciplines, research approaches, and geographical representation of parasitic plant research. Assembling specialists with different perspectives, all focused around the common theme of plant parasitism, provides a stimulating environment for learning, exchanging ideas, meeting with old and new colleagues, and making new acquaintances. The Congress will include presentations on the cutting edge of parasitic plants research and on management technologies of parasitic weeds. A major emphasis in the Congress will be the fostering of interaction among participants.

Please **seriously consider attending the Congress**, mark the Congress dates in your diary, and indicate your interest in attending the Congress by submitting the preliminary registration form that is included below.

Almost five years have passed since **Professor Edward S. Teryokhin** has passed away. Professor Teryokhin was one of the most important specialists in broomrape taxonomy, with original contributions to the understanding of parasitic plants. His book on broomrapes, first published in Russian (1988) and then translated into English under the title *Weed Broomrapes* is a valuable contribution for all students of root parasites, and especially those interested in anatomical, taxonomic, ecological and embryological aspects of these plants. As a deep-rooted revolutionist of broomrape taxonomy, he insisted on separating the two important tribes of the genus *Orobanche* into two distinct genera: *Orobanche* and *Phelipanche*. The name *Phelipanche* was first given to *P. ramosa* by Auguste Pomel (1821-1898), a French mines engineer stationed in Algeria, who was very active in the study of North African fauna and flora. Under the developing molecular knowledge, and in particular with the recent studies by Gerald Schneeweiss and his colleagues in Vienna, splitting *Orobanche* into separate genera is now widely accepted. As a result, we should now use the names *Phelipanche ramosa* (L.) Pomel and *P. aegyptiaca* (Pers.) Pomel instead of *O. ramosa* and *O. aegyptiaca*.

These aspects and many others, including basic and applied problems with both weedy and non-weedy parasites will be discussed in the coming IPPS Congress, together with a comprehensive discussion on ways for parasitic weeds management.

We are looking forward to meeting you at the Congress!

Danny Joel, IPPS President

9TH WORLD CONGRESS ON PARASITIC PLANTS

Sunday June 3 to Thursday June 7, 2007
Omni Hotel, Charlottesville, Virginia USA

PROGRAM

Contribution and participation from researchers on *any* weedy and non-weedy parasitic plants is encouraged.

The program will consist of oral presentations and posters. Oral presentations will be invited or selected from submitted preliminary abstracts.

Topics will include but are not limited to **the following:**

Evolution and phylogeny of parasitic plants
Parasite biochemistry and physiology (including molecular biology)
Floral biology
Ecology and population biology of parasitic species
Host-parasite communication (including germination stimulation, haustorial induction, etc.)
Host and non-host responses to parasitism
Parasitic weed management
Regulation and Phytosanition

Or any other aspects, descriptions, approaches and ideas related to parasitic plants.

Participation of students and young researchers is strongly encouraged.

Scientific Advisory Committee

Jim Westwood, USA (Chair)
Abdel Gabar T. Babiker, Sudan
Philippe Delavault, France
Grama Dhanapal, India
Atef Haddad, Syria
Joseph Hershenhorn, Israel
Erika Maass, Namibia
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John Yoder, USA
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Andrea Wolfe, USA
Koichi Yoneyama, Japan

THE VENUE

Charlottesville and the surrounding area

Nestled in the foothills of the legendary Blue Ridge Mountains, Charlottesville and the surrounding area is known for natural beauty and a variety of accommodations, attractions, events, and activities that make it an ideal destination for visitors of all ages. The area is also quickly becoming a choice shopping and entertainment destination with the restored Paramount Theater, the newly built Charlottesville Amphitheater and The John Paul Jones arena, and festivals that attract visitors from around the world.

Charlottesville is home to the University of Virginia and close to several important US historic sites, including Monticello home to Thomas Jefferson and his legacies, the homes of James Monroe, fifth president of the United States, and James Madison, fourth president and author of the Constitution. Dining out in Charlottesville is an experience you won't want to miss. You'll find everything from your taste buds desire. The Downtown district alone has more than 50 locally owned restaurants.

Conference Site

The Conference will be held at the Omni Charlottesville. The Omni is a first class conference hotel conveniently located within easy walking distance of many shops and restaurants on the Downtown Mall. Hotel website: http://www.omnihotels.com/FindAHotel/Charlottesville.aspx.

Local Organizing Committee
Michael P. Timko - Chair
Lytton Musselman
Jim Westwood

REGISTRATION

The registration fee includes admission to all talks and posters, an opening reception, two coffee breaks each day, lunches, a banquet, and a field trip to see local parasites and visit the house, gardens, and plantation of Monticello, the mountaintop home of Thomas Jefferson, third president of the United States, who was not only a gifted architect, but also a plant scientist.

Approximate registration fee: $380
Hotel rates: $117/night + tax.

A second circular, with a preliminary program will be distributed in September 2006.

Meanwhile, please provide an indication of your interest in attending the Congress by filling in the form at the end of this newsletter and sending it to Jim Westwood.

INTERNATIONAL SYMPOSIUM ON INTEGRATING NEW TECHNOLOGIES FOR *STRIGA* CONTROL: TOWARDS ENDING THE WITCH-HUNT

November 5-11, 2006 Addis Ababa, Ethiopia. Sponsored by International Sorghum and Millet Collaborative Research Support Program (INTSORMIL), Purdue University and Ethiopian Institute of Agricultural Research (EIAR).

The parasitic weed *Striga* (witchweed) is the scourge of agriculture in much of Africa, parts of Asia, and even in the United States. *Striga* attacks the major cereal grains and legumes in sub-Saharan Africa, on average halving the already very low yields of subsistence farmers. The *Striga* problem has been a major reason why crop productivity has remained at or below subsistence, leaving poor farmers with no way out of a situation that is only getting worse.

For many decades, research approaches on *Striga* targeted eradication, suppression, or breeding for host crops that support fewer emerged *Striga* plants. Decades of such efforts have led to few successes. More recently, basic research efforts that have focused on the more fundamental biology of the parasite and its association with its hosts have led to a far better understanding of the enemy. That understanding, in turn, led to series of successes in the field that are being expanded slowly throughout Africa.
Will these technologies be sustainable or will they fail? Highly successful weeds such as *Striga* have a tendency to evolve resistance to all types of control. Ways to circumvent these pitfalls need to be crafted. As no single method is likely to be perfect, it is clear that proven methods must be integrated with each other. However, integration is often an anathema to basic scientists who are taught to alter single variables at a time in their experiments. That is why we are bringing together key leaders in development of the new knowledge based control strategies—both those that have been successfully deployed in the field and those currently under development that show great promise. Bringing these experts together will allow discussion of strategies that can be integrated with each other to develop more durable and sustainable methods that will be useful for decades to come. For major speakers, we have invited leaders in the field who have been supplying the basic biology, genetics, biochemistry, and molecular information that have offered insights and generated technologies for dealing with *Striga.*

Other scientists (molecular biologists, breeders, agronomists, and social scientists) who have been key in the fight against *Striga* are also invited to engage in structured panel discussions. Together with facilitators who are experts at stimulating people to integrate knowledge into practice, we hope this meeting will provide the forum for crafting new and creative suggestions for a series of integrated management packages that can render effective control of *Striga*.

The symposium is open to all scientists dealing with *Striga* who want to learn and share knowledge. Invited speakers will present lectures and lead discussions. All other participants are encouraged to present posters of their most recent findings and observations. **See Forthcoming Meetings for contact details.**

HYDNORA RESEARCH AT THE PLANT PARASITE LAB, OLD DOMINION UNIVERSITY, USA

Our research group in collaboration with University of Namibia and University of Peradeniya, Sri Lanka have been working extensively on the biology of the strange root holoparasite *Hydnora*. The center of diversity of this ancient lineage is southern Africa. We are interested in a broad range of anatomical, ecophysiological, and taxonomic aspects of this bizarre genus.

Specifically we have completed an anatomical study of the novelty of tissue arrangement (homeosis) in the vegetative body of *H. triceps*. Other anatomical problems elucidated include the unique seedling morphogenesis in the group. Work continues on the specific details of the host parasite interface, in relation to nutrient acquisition. Furthermore, we have completed studies of the mineral and stable isotope (13C and 15N) profiles of different *Hydnora*-host associations.

During field work in Namibia and South Africa in 2005, we confirmed the extreme host specificity of *H. triceps* on *Euphorbia dregeana* and the relatively broad ranges of *H. africana* and *H. abyssinca* (syn. *H. johannis*). In addition, the insect trapping mechanism of the *H. africana* chamber flower was experimentally evaluated, and seed dispersers were identified.

We are currently soliciting tissue samples for a molecular phylogeny of the Hydnoraceae. If you have any interest in this group, locations to report, or wish to collaborate, please do not hesitate to contact us. For further details please consult our website: http://www.odu.edu/webroot/instr/sci/plant.nsf/pages/hydnoraplant.

Collaborators:

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Kushan Tennakoon: kushant@pdn.ac.lk, Dept. of Botany, University of Peradeniya, Peradeniya 20400 Sri Lanka

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CURIOSITIES

I wonder how many others writing about *Orobanche ramosa* have suffered the problem that at least some versions of

Word including mine (Office Word 2003) automatically correct '*ramosa'* to '*ramose'*. Key it in quickly and move on and you notice nothing. It happens in both US and UK English. No warning – no wiggly red lines such as come up with all other latin terms, including '*diffusa', 'alata', 'striata'* etc. Go into 'Tools – Auto correct options' and you find the hundreds of words that are automatically corrected, but no '*ramosa*'. Fortunately, if you insert the instruction that '*ramosa*' be replaced with '*ramosa*' all is well!

Chris Parker.

NOTES FROM A ROAMING EDITOR

On a recent visit to the island of Raratonga (Cook Islands) in the S. Pacific it was notable how introduced invasive species were locally dominating both fauna and flora. The only land bird seen in a week was the exotic myna bird from India, introduced to control insect pests of coconut and now utterly dominant. Vegetation was often also dominated by exotics including the dreaded 'mile-a-minute' *Mikania micrantha,* but this in turn was being parasitized at at least one site by *Cuscuta campestris*. This is perhaps the first report of this species on the islands.

Chris Parker.

COST 849 - PARASITIC PLANT MANAGEMENT IN SUSTAINABLE AGRICULTURE

This programme, funded by European Union via European Science Foundation, has had no new meetings in the past 6 months but is now being wound up. Its final workshop will now be held in Lisbon, Portugal on 23-24 November (not in Israel in October as previously planned). The programmes, abstracts and reports of past meetings, and information on the November meeting, are on the COST849 web-site (http://cost849.ba.cnr.it/) or will be added in due course.

A NEW EWRS WORKING GROUP: PARASITIC WEEDS

A new Working Group 'Parasitic Weeds' has recently been established within the European Weed Research Society (EWRS).

Background

Parasitic plants are becoming a severe constraint to Mediterranean and Tropical agriculture on major crops and the efficacy of available means to control them is minimal. The most economically damaging parasitic weeds are members of the genera *Striga* (witchweeds) and *Orobanche* (broomrapes). Various species of the latter are important in southern and eastern Europe, the Middle East and North Africa. For example, *O. crenata* causes huge damage to legume crops (faba bean, lentil, pea and common vetch) in southern Europe; *O. cumana* threatens sunflower in southern and eastern Europe; *O. minor* is important in central Europe on clover; *O. ramosa* attacks potato, tobacco, tomato and hemp; and species such as *O. foetida* that cause problems in N. Africa are also present in Europe.

The main focus of research on parasitic weeds has been on their management when infecting important crops. Control strategies have centred around agronomic practices and the use of herbicides, although success has been marginal. Novel integrated control programmes are necessary. In addition, global warming together with changing land use patterns means that some geographical areas and farming systems that do not currently suffer from parasitic weeds in Europe could become affected within coming decades. It is therefore desirable to pre-empt the spread of parasitic weeds and to consider, for example, how quarantine regulations might achieve this.

WG Objectives

The main objective of the WG is to increase the understanding of the interaction between parasitic weeds and their hosts and to implement sustainable means to control the parasites.

The lack of interdisciplinary involvement has been a major factor that has impeded progress in the sustainable control of parasitic weeds. The establishment of the new WG aims to address this deficiency, by including weed scientists who specialize in botany, ecology, plant anatomy, physiology, biochemistry, molecular biology, breeding, plant pathology, chemistry and agronomy. Joint research within the proposed WG will encourage the transfer of fundamental research into control strategies for field application and shoud ultimately yield sustainable management measures for the variety of parasitic weeds that affect agriculture and forestry in Europe.

The WG will integrate fundamental, biotechnological and marker-technology science and applied research concepts to develop sustainable means of parasitic weed management, integrating cultural practices, genetic resistance, and novel methods of biological- and chemical control.

Research topics to be covered

Considering the involvement of groups with different expertise in the WG, many different fields of research will be covered, including:

- Parasitic weeds of three different groups: root parasites (mainly *Orobanche*), climbers (*Cuscuta*), and mistletoes (mainly *Viscum*).
- Physiology of parasitism: seed germination, attachment, parasite development, interactions between the host and the parasite.
- Integrated weed management strategies and the economics of controlling parasitic plants.
- Identification, augmentation, exploitation and formulation of biocontrol agents.
- Novel cultural practices.
- Molecular and classical taxonomy and race identification.
- Developmental aspects of host-parasite interaction, including structural, physiological, genetic and molecular agro-ecology of parasitic plants that will have significant implications in the development of control measures.
- Distribution, incidence and importance of the parasitic weeds in Europe, including the invasion and progression of parasitic weeds under predicted global climate change scenarios, as well as evolutionary changes within the species.
- Quarantine measures and regulations for control of spread of parasitic plants.
- Monitoring the parasitic plant populations for frequency of virulence factors and for genetic variation.
- Development and evaluation of methods for screening and assessment of crop resistance to parasitic plants, and identification of both resistance genes and resistance mechanisms.

Proposed activities for the years 2006-07

Formal inauguration of the WG will take place at the International Conference 'Novel and Sustainable Weed Management in Arid and Semi-Arid Agro-Ecosystems' to be held at the Hebrew University of Jerusalem, Rehovot, Israel, October 15-20, 2006, and it will have a joint session with the last meeting of the European COST849 action 'Parasitic plant management in sustainable agriculture'.

A specific workshop on parasitic weeds may be organized in 2007 as part of the EWRS symposium in Norway.

A mailing list is being created for distribution of announcements and requests, and a website is being prepared. Meanwhile, information will be available on the EWRS website (http://www.ewrs.org/).

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THESIS

Aad van Ast (PhD thesis, Wageningen University, Wageningen, The Netherlands, June, 2006) **The influence of time and severity of *Striga* infection on the *Sorghum bicolor-Striga hermonthica* association.** (Supervision, Martin Kropff)

This thesis presents the results of a study on the interaction between the parasitic weed Striga hermonthica (Del.) Benth. and sorghum (*Sorghum bicolor* [L.] Moench). The main objective of the study was to investigate the effects of time and level of *Striga* infection on the interaction between host plant and parasite. Consequences for sorghum performance and the growth and development of the parasite were examined. A comparison between two sorghum cultivars differing in level of *Striga* tolerance, revealed that the absence of a negative effect of *Striga* infection on photosynthetic rate and a delayed time of first *Striga* infection both contributed to the lower extent of yield reduction of the tolerant cultivar .Likewise, in an experiment with a wide range of *Striga* seed infestation levels, it was observed that higher soil infestations levels did not only result in a higher *Striga* infection level, but also in an advanced time of first *Striga* infection. The importance of time of infection was further investigated in a pot experiment in which the time of infection was artificially delayed. *Striga* parasitism and reproduction, and the detrimental effects of *Striga* on crop performance could be strongly reduced by delaying the time of first infection. Prospects of reducing *Striga* parasitism by means of cultural control methods that are based on the principle of a delayed onset of *Striga* attachment were assessed. In a pot experiment, the combination of shallow soiltillage, deep planting and the use of transplants resulted in a four-week delay in first emergence of the parasite, a strongly reduced infection level of the sorghum host and highly improved sorghum yields. Evaluation of these methods under field conditions resulted in a 85% reduction in *Striga*-infection level, but as no delay in time of parasite infection was established, no beneficial effect on crop yield was obtained. Potential causes of the absence of a delay in *Striga* infection time under field conditions were discussed and alternative options for establishing a delayed infection in the field were proposed.

SANDALWOOD

Contrary to the announcement in Haustorium 47, one further issue of Sandalwood Research Newsletter (No. 21) was published in March 2006. But all future issues will now be published electronically by James Cook University in PDF format, on www.jcu.edu.au/school/tropbiol/srn/ the web-site on which all back issues can also be found. For any further information and to be included on the SRN email alert list please contact the new editor Tony Page at James Cook University, P.O. Box 6811, Cairns, 4870 Australia (tony.page@jcu.edyu.au).

FORTHCOMING MEETINGS

Novel and sustainable weed management in arid and semi-arid agro-ecosystems (also the inauguration of the new EWRS working group 'Parasitic weeds'), Rehevot, Israel, 15-21 October, 2006. Further information from the Organizing Committee at wgarid@agri.huji.ac.il or visit: www.agri.huji.ac.il/aridconference.
STOP PRESS – ABOVE POSTPONED

COST 849 – Parasitic plant management in sustainable agriculture - final meeting, Lisbon, Portugal, 23-24 November, 2006. Visit: http://cost849.ba.cnr.it/

International Workshop on faba bean breeding and agronomy, Cordoba Spain, 25-27 October, 2006. Further information from Ana Maria Torres, email: anam.torres.romero@juntadeandalucia.es

International Symposium on Integrating new technologies for *Striga* control: towards ending the witch-hunt, Addis Ababa, Ethiopia, November 5-11, 2006. Contact: Gebisa Ejeta: gejeta@purdue.edu

9th World Congress on Parasitic Weeds, Charlottesville, Virginia, USA, 3-7 June, 2007. See full notice above.

GENERAL WEB SITES

For individual web-site papers and reports see LITERATURE

For information on the International Parasitic Plant Society, past and current issues of Haustorium, etc. see: http://www.ppws.vt.edu/IPPS/

For past and current issues of Haustorium see also: http://web.odu.edu/haustorium

For the ODU parasite site see: http://www.odu.edu/webroot/instr/sci/plant.nsf/pages/parasitic_page

For Lytton Mussleman's *Hydnora* site see: http://www.odu.edu/webroot/instr/sci/plant.nsf/pages/lecturesandarticles

For Dan Nickrent's 'The Parasitic Plant Connection' see: http://www.science.siu.edu/parasitic-plants/index.html

For The Mistletoe Center (including a comprehensive Annotated Bibliography on mistletoes) see: http://www.rmrs.nau.edu/misteltoe/welcome.html

For information on activities and publications of the parasitic weed group at the University of Hohenheim see: http://www.uni-hohenheim.de/~www380/parasite/start.htm

For information on, and to subscribe to PpDigest see: http://omnisterra.com/mailman/listinfo/pp_omnisterra.com

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

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

For the Parasitic Plants Database, including '4000 entries giving an exhaustive nomenclatural synopsis of all parasitic plants' the address is: http://www.omnisterra.com/bot/pp_home.cgi

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

For information on EC-funded project 'Improved *Striga* control in maize and sorghum (ISCIMAS) see: http://www.plant.dlo.nl/projects/*Striga*/

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

For past and future issues of the Sandalwood Research Newsletter, see: www.jcu.edu.au/school/tropbiol/srn/

For information on the meetings in Rehevot, Israel, 15-21 October, 2006 (see above), see: www.agri.huji.ac.il/aridconference

For information on the work of the African Agricultural Technology Foundation (AATF) on *Striga* control in Kenya, see: http://africancrops.net/striga/

LITERATURE

Abubacker, M.N., Prince, M. and Hariharan, Y. 2005. Histochemical and biochemical studies of parasite-host interaction of *Cassytha filiformis* Linn. and *Zizyphus jujuba* Lamk. Current Science 89: 2156-2159. (Histochemical studies revealed the presence of specialized glandular cells facilitating adhesion of the parasite to the host, and high phosphatase activity in the parasite. Some photosynthesis was detected.)

Adler, L.S. 2003. Host species affects herbivory, pollination, and reproduction in experiments with parasitic *Castilleja.* Ecology 84: 2083-2091. (*Castilleja indivisa* grew much more vigorously and was more attractive to pollinators when growing on on a lupin host than on a grass. This and other observations confirm that both direct and indirect effects may shape the selective pressures mediating interactions between hosts and parasites.)

Ahonen, R., Puustinen, S. and Mutikainen, P. 2006. Host use of a hemiparasitic plant: no trade-offs in performance on different hosts. Journal of Evolutionary Biology 19: 513-521. (Greenhouse studies with *R. serotinus* grown on *Agrostis capillaris* and *Trifolium pratense* and without a host failed to confirm any genetic factors likely to affect the evolution of specialization for particular hosts.)

Akiyami, K. and Hayashi, H. 2006. Strigolactones: chemical signals for fungal symbionts and parasitic weeds in plant roots. Annals of Botany 97: 925-931. (A full version of the work described in a letter to Nature in 2005, which also formed the basis for a Literature Highlight in Haustorium 47, describing the involvement of strigolactones in the branching of arbuscular mycorrhizae and hence an explanation for the wide occurrence of these compounds in root exudates.)

Andolfi, A., Boari, A., Evidente, A. and Vurro, M. 2005. Metabolites inhibiting germination of *Orobanche ramosa* seeds produced by *Myrothecium verrucaria* and *Fusarium compactum*. Journal of Agricultural and Food Chemistry 53: 1598-1603. (A range of trichothecenes were separated from both species, all of which inhibited germination of *O. ramosa* but were also toxic to brine shrimps, *Artemia salina*. Verrucarin E, the main metabolite from *M. verrucaria* was toxic to neither.)

Arruda, R., Carvalho, L.N. and del Claro, K. 2006. Host specificity of a Brazilian mistletoe, *Struthanthus* aff. *polyanthus* (Loranthaceae), in cerrado tropical savanna. Flora (Jena) 201(2): 127-134. (An English version of the paper by Arruda and Carvalho, 2004 (see Haustorium 48), noting most occurrence of *Struthanthus* on species with rough bark, especially *Kielmeyera coriacea, Pouteria ramiflora* and *Styrax ferrugineus*.)

Bardgett, R.D., Smith, R.S., Shiel, R.S., Peacock, S., Simkin, J.M., Quirk, H. and Hobbs, P.J. 2006. Parasitic plants indirectly regulate below-ground properties in grassland ecosystems. Nature (London) 439(7079): 969-972. (Showing that *Rhinanthus minor* has strong direct above-ground effects, increasing plant diversity and reducing productivity, together with indirect below-ground effects, ultimately increasing rates of nitrogen cycling. Thus parasitic plants can act as major drivers of both above- and below-ground properties of grassland ecosystems.)

Bennett, A.E., Alers-Garcia, J. and Bever, J.D. 2006. Three-way interactions among mutualistic mycorrhizal fungi, plants, and plant enemies: hypotheses and synthesis. The American Naturalist 167: 141-152. (A broad-ranging review, commenting that 'parasitic plants might also be expected to benefit by feeding on hosts with a mycorrhizal association because they often directly tap into the xylem or phloem of a host plant, thereby avoiding plant defences.)

Besri, M. 2005. *Viscum cruciatum*: a threat to the olive production in the Moroccan Rif Mountains. In: Kalaitzaki, A., Alexandrakis, V. and Varikou, K. (eds) Bulletin OILB/SROP 28(9): 169-173. (A detailed description of *V. cruciatum*, and its damaging effects on almond, prune, fig, walnut, pear, peach, grape, mulberry and quince and also on *Nerium oleander* and *Populus alba.* Infected trees produce witches brooms and show reduced growth and yield.)

Birschwilks, M., Haupt, S., Hofius, D. and Neumann, S. 2006. Transfer of phloem-mobile substances from the host plants to the holoparasite *Cuscuta* sp. Journal of Experimental Botany 57: 911-921. (Confirming non-selective transfer of sucrose, amino acids, phytohormones, dyes and virus particles from host phloem to parasite haustorium via inter-specific plasmodesmata.)

Braby, M.F. 2005. Inland breeding records for two mistletoe butterflies (Lepidoptera) from Northern Victoria. Australian Entomologist 32(4): 161-162. (Recording the breeding of *Delias harpalyce* (Donovan) (Pieridae) and *Ogyris abrota* (Westwood) (Lycaenidae) on the mistletoe *Muellerina eucalyptoides* parasitizing *Eucalyptus camaldulensis*.)

Brand, J., Kimber, P. and Streatfield, J. 2006. Preliminary analysis of Indian sandalwood (*Santalum album* L.) oil from a 14-year-old plantation at Kununurra, Western Australia. Sandalwood Research Newsletter 21: 1-3. (Results suggest that, while oil quality was good, heartwood volume and oil yield were relatively low and variable, and future plantings need to be with seed from superior oil-producing parent trees.)

Brandt, J.P., Hiratsuka, Y. and Pluth, D.J. 2005. Germination, penetration, and infection by *Arceuthobium americanum* on *Pinus banksiana.* Canadian Journal of Forest Research 35: 1914-1930. (A study of the timing and histopathology of germination and establishment of

A. americanum on *P. banksiana*. Symptoms of infection usually occurred after 13-15 months.)

Bratanova-Doncheva, S., Mirtchev, S. and Lyubenova, M. 2005. Dendrochronological investigation of mistletoe growth impact (*Loranthus europaeus* L.) on European chestnut (*Castanea sativa* Mill.) in South West Bulgaria. In: Abreu, C.G., Rosa, E. and Monteiro, A.A. (eds) Acta Horticulturae 693: 367-370. (Noting that trees affected by *L. europaeus* showed a sharp decrease in diameter growth.)

Calvin, C.L. and Wilson, C.A. 2006. Comparative morphology of epicortical roots in Old and New World Loranthaceae with reference to root types, origin, patterns of longitudinal extension and potential for clonal growth. Flora (Jena) 201(1): 51-64. (A detailed survey of epicortical roots, the most common haustorial type for Loranthaceae outside Africa. Three types are described; basal, cauline and adventitious and their patterns of axis extension – by monochasial sympodium, dichasial sympodium or monopodium. The wide distribution of genera with epicortical roots suggests it is an ancestral trait for aerial Loranthaceae.)

Carlón, L., Gómez Casares, G., Laínz, M., Moreno Moral, G. and Sánchez Pedraja, Ó. 2002. (A propos of some *Orobanche* (Orobanchaceae) of northwestern Spain and their treatment in Flora Iberica, Vol. XIV (2001).) (in Spanish) Documentos - Jardín Botánico Atlántico No.1, 44 pp. (Noting a range of additions and corrections to the findings of Foley, 2001 (see Haustorium 40), for the region of Cantabria, and publishing a description of *O. aconiti-lycoctoni*, sp. nov.)

Casado, C., Rubiales, D., Sillero, J.C., Bracamonte, E. and de Prado, R. 2004. (Partial tolerance to glyphosate in various lines of peas (*Pisum sativum*).) (in Spanish) In: Pedrero, G.M., Valenzuela, J.A.D., Díaz, G.M. and Ruiz, R.A.O. (eds) Memoria XVI Congreso Latinoamericano de Malezas y XXIV Congreso Nacional de la Asociación Mexicana de la Ciencia de la Maleza, Manzanillo, Colima, México, del 10 al 12 de Noviembre de 2003., pp. 323-326. (In studies toward control of *Orobanche crenata*, two commercial pea varieties, Ballet and Messire, were shown to tolerate glyphosate at 80 g/ha.)

Chlebicki, A. 2005. Some species of the genus *Diatrype* from the Czech Republic preserved in PRM, BRNM and KRAM. Czech Mycology 57(1/2): 117-138. (One species of *Diatrype*, possibly *D. disciformis,* recorded on *Loranthus europaeus*.)

Ciucă, M., Păcureanu, M. and Iuoras, M. 2004. RAPD markers for polymorphism identification in parasitic weed *Orobanche cumana* Wallr. Romanian Agricultural Research 21: 29-32.

Colquhoun, J.B., Eizenberg, H. and Mallory-Smith, C.A. 2006. Herbicide placement site affects small broomrape (*Orobanche minor*) control in red clover. Weed Technology 20: 356-360. (Neatly demonstrating that control of *O. minor* by imazamox depends on translocation of herbicide from the foliage to the roots of the host clover where it is absorbed directly from the host and/or via exudation into the rhizosphere.)

Combes, C. 2005. The art of being a parasite. Chicago, USA: University of Chicago Press. 291 pp. (Translated from the French by Daniel Simberloff this book is primarily concerned with animal parasites, but of potential relevance to plants.)

Cooney, S.J.N. and Watson, D.M. 2005. Diamond firetails (*Stagonopleura guttata*) preferentially nest in mistletoe. Emu, Journal of the Royal Australasian Ornithologists Union 105: 317-322. (Although mistletoe (unspecified in abstract) accounted for no more than 2.3% of the canopy, 30% of the nests of the bird *S. guttata* were in mistletoe.)

Cooney, S.J.N., Watson, D.M. and Young, J. 2006. Mistletoe nesting in Australian birds: a review. Emu, Journal of the Royal Australasian Ornithologists Union 106(1): 1-12. (Contrary to the curious title, this paper comprehensively reviews the nesting of birds in mistletoe, adding excellent data from Australia, where 217 species from 29 families are recorded using mistletoes for nesting (though none are obligate users), increasing the known world-wide occurrence from 43 to 60 bird families. Suggesting various reasons for the habit, including micro-climatic effects and greater safety from predators.)

Cullings, K., Raleigh, C. and Vogler, D.R. 2005. Effects of severe dwarf mistletoe infection on the ectomycorrhizal community of a *Pinus contorta* stand in Yellowstone Park. Canadian Journal of Botany 83: 1174-1180. (Reporting a significant shift in the dominant species of ectomycorrhiza on the roots of *P. contorta* from *Cortinarius* in uninfected trees to *Russula* and *Piloderma* spp. in those infected by a complex of *Arceuthobium* spp.)

Delos, M., Huguet, B., Saumur, L., Pillon, O., Eychenne, N. and Faure, A. 2005. (Rape, pea and horsebean crops 2004/2005: plant health review.) (in French) Phytoma 589: 24-27. (Noting an 'alarming' infestation of *Orobanche ramosa* in rapeseed in the Poitou-Charentes region.)

Demirkan, H. 2005. (Investigation on allelopathic effects of some plant materials on the growth of *Orobanche ramosa* L.) (in Turkish) Ege Üniversitesi Ziraat Fakültesi Dergisi 42(3): 45-54. (Various effects observed when a range of plant materials were incorporated into the soil.)

Devkota, M.P. 2005. Biology of mistletoes and their status in Nepal Himalayas. Himalayan Journal of Sciences 3(5): 85-88. (A general review of the biology of Loranthaceae and Viscaceae, identifying the potential threats to mistletoes in Nepal Himalayas and suggesting their management requirements.)

Devkota, M.P. and Glatzel, G. 2005. Mistletoes of the Annapurna Conservation Area, Central Nepal

Himalayas. Journal of Japanese Botany. 80(1): 27-36. (An inventory of the mistletoes of this region included 8 species in Loranthaceae (4 *Scurrula* spp., *Taxillus vestitus, Helixanthera ligustrina, Macrosolen cochinchinensis* and *Loranthus odoratus*) and 4 *Viscum* spp. Hosts included 95 tree species in 45 families. Loranthaceae generally had wider host range than *Viscum* spp. Degraded marginal forests, sunny warm slopes and ridges below 3000 m were most favoured sites.)

Devkota, M.P. and Koirala, A. 2005. New record of *Viscum monoicum* Roxb. ex DC. (Viscaceae) for the Nepal Himalayas. Journal of Japanese Botany. 80(1): 56-57. (Reporting the first record of *Viscum monoicum* from Nepal Himalayas, at 980m in Central Nepal, on the host tree *Shorea robusta*.)

Dicko, M.H., Gruppen, H., Barro, C., Traore, A.S., van Berkel, W.J.H. and Voragen, A.G.J. 2005. Impact of phenolic compounds and related enzymes in sorghum varieties for resistance and susceptibility to biotic and abiotic stresses. Journal of Chemical Ecology 31: 2671-2688. (Showing that levels of proanthocyanidins and particularly 3-deoxyanthocyanidins, in sorghum seeds are useful markers for resistance to a range of biotic stresses, including *Striga*, while content of phenolics is not.)

Dobbertin, M., Hilker, N., Rebetez, M., Zimmermann, N.E., Wohlgemuth, T. and Rigling, A. 2005. The upward shift in altitude of pine mistletoe (*Viscum album* ssp. *austriacum*) in Switzerland - the result of climate warming? International Journal of Biometeorology 50(1): 40-47. (Noting the frequent occurrence of *V. album* on *Pinus sylvestris* and the increased mortality of infected trees. Also the upper limit of distribution is now 1,250 m, compared with 1,000-1,100 m found in a survey 100 years ago. Calculations suggest this limit could be 1,600 m by 2030.)

Domina, G. and Scibetta, S. 2006. Research on *Orobanche crenata* management in Sicily from the 19th to the early 20th century. Phytoparasitica 34: 111-114. (Discussing hand pulling, use of resistant cultivars, late sowing and sowing density as techniques being used or researched currently – in early 21st century, not early 20th.)

El-Hamid, M.M.A. 2003. Dodder (*Cuscuta epilinum)* control in flax (*Linum usitatissimum*, L.). Egyptian Journal of Agricultural Research 81: 1735-1746. (Recording the damaging effects of *C. epilinum* on flax, and the partial control and increased yields achieved with butralin and imidazolinone herbicides.)

El-Halmouch, Y., Benharrat, H. and Thalouarn, P. 2006. Effect of root exudates from different tomato genotypes on broomrape (*O. aegyptiaca*) seed germination and tubercle development. Crop Protection 25: 501-507. (In comparisons of tomato cultivars with wild species, the most resistant were *Lycopersicum pennellii* LA 716*, L. hirsutum* PI 247087*, L. pimpinellifolium hirsute* and *L. chilense* LA 1969. The exudates from the first two of these were less stimulatory than those from the cultivars, while that from *L. pennellii* LA 716 was distinctly inhibitory.)

Elzein, A., Kroschel, J. and Leth, V. 2006. Seed treatment technology: an attractive delivery system for controlling root parasitic weed *Striga* with mycoherbicide. Biocontrol Science and Technology 16(1/2): 3-26. (Gum arabic, carboxymethylcellulose (CMC) and pectin were compared as seed-coating materials combined with microconidia or dried chlamydospores of *Fusarium oxyporum* (Foxy 2). In pot experiments chlamydospores in gum Arabic gave best results, reducing germination of *S. hermonthica* by at least 70%.)

Evidente, A., Andolfi, A., Fiore, M., Boari, A. and Vurro, M. 2006. Stimulation of *Orobanche ramosa* seed germination by fusicoccin derivatives: a structure-activity relationship study. Phytochemistry 67: 19-26. (Comparing 25 analogues and derivatives of fusicoccin and cotylenol for stimulant activity on *O. ramosa* and concluding that the most important structural feature for activity appears to be the primary hydroxy group at C-19, and noting that the highly active dideacetyl derivative of fusicoccin could be readily synthesized and perhaps used for suicidal germination.)

Foley, M.J.Y. 2004. Orobanchaceae of the Arabian Peninsula. Candollea 59: 231-253. (Reviewing the taxonomy, ecology and distribution in Arabia of *Cistanche phelypaea, C. rosea* and *C. violacea* and 13 species of *Orobanche - O. aegyptiaca, O. ramosa, O. perangustata* (sp. nov.) *O. muteliformis* (sp. nov.), *O. schultzii, O. bungeana, O. eriophora, O. hypertomentosa, O. cernua, O. crenata, O. minor, O. dhofarensis* and *O. abyssinica*. *O. lavandulacea* may also occur.)

Fraga, P., Garcia, Ó. and Pons, M. 2003. (Notes and contributions to the knowledge of the flora of Menorca (V).) (in Spanish) Bolletí de la Societat d'Història Natural de les Balears 46: 51-64. (Recording *Orobanche santolinae* for the first time in Minorca, Balearic Islands.)

Ghosheh, H.Z., Al-Tamimi, E. and Hameed, K.M. 2006. Effect of olive jift and sublethal glyphosate applications on faba beans (*Vicia faba*). Acta Agronomica Hungarica 54(1): 61-68. (Confirming that faba beans were not significantly affected by being grown in soil amended up to 50% with olive jift (a milling byproduct, reported to suppress *Orobanche* spp. in Jordan), nor by foliar sprays of glyphosate at 40 g a.i./ha.)

Gomba, A. and Kachigunda, B. 2005. Effect of leaf extracts of multipurpose trees on the life cycle of *Striga asiatica* (L.) Kuntze. Journal of Agronomy 4: 161-164. (Crude leaf extracts of *Sesbania sesban, Leucaena leucocephala, Acacia angustissima* and *Calliandra calothyrsus* caused

24-49% reduction in germination of *S. asiatica* in a Petri dish assay.)

González-Verdejo, C.I., Barandiaran, X., Moreno, M.T., Cubero, J.I. and di Pietro, A. 2006. A peroxidase gene expressed during early developmental stages of the parasitic plant *Orobanche ramosa*. Journal of Experimental Botany 57: 185-192. (Cloning and characterization of a peroxidase gene that shows expression correlated with the radical tip preceding host attachment.)

Grenz, J.H., Manschadi, A.M., DeVoil, P., Meinke, H. and Sauerborn, J. 2005. Assessing strategies for *Orobanche* sp. control using a combined seedbank and competition model. Agronomy Journal 97: 1551-1559. (Describing the development of a model combining *Orobanche crenata* seedbank dynamics and *Vicia faba/O. crenata* competition within the simulation framework of the Agricultural Production Systems Simulator (APSIM). Yet to include some external factors, such as temperature, but giving indications close to field observation and helping to emphasize the need for integrated systems for long-term reduction.)

Gurney, A.L., Slate, J., Press, M.C. and Scholes, J.D. 2006. A novel form of resistance in rice to the angiosperm parasite *Striga hermonthica*. New Phytologist 169: 199-208. (The parasite penetrates, but fails to make vascular connections with, plants of the rice variety Nipponbare. Mapping identified QTLs important in the resistance.)

Haidar, M.A. and Sidahmed, M.M. 2006. Elemental sulphur and chicken manure for the control of branched broomrape (*Orobanche ramosa*). Crop Protection 25: 47-51. (Elemental sulphur up to 12 t/ha had no influence on crops or *O. ramosa*. Chicken manure at 20 t/ha reduced *O. ramosa* and increased yield in both aubergine and potato.)

Harbaugh, D.T. 2006. Molecular and morphological phylogeny of sandalwoods: insights for biogeography and taxonomy. Sandalwood Research Newsletter 21: 8. (Describing a PhD research project to be completed in 2007.)

Hedberg, A.M., Borowicz, V.A. and Armstrong, J.E. 2005. Interactions between a hemiparasitic plant, *Pedicularis canadensis* L. (Orobanchaceae), and members of a tallgrass prairie community. Journal of the Torrey Botanical Society 132: 401-410. (In pot studies with all combinations of *P. canadensis* with *Andropogon gerardii, Solidago canadensis* and *Desmodium canadense*, the parasite had moderate effect on *S. canadensis* but little or none on the others. Competitive relationships between these host species were not affected, but in natural prairie, species richness was positively correlated with increasing *P. canadensis* cover.)

Hosner, P.A. 2006. Regurgitated mistletoe seeds in the nest of the yellow-crowned tyrannulet (*Tyrannulus elatus*). Wilson Bulletin 117: 319-321. (Describing a nest of *Tyrannulus elatus* built largely of mistletoe (unspecified in abstract) seeds, apparently exploiting their adhesive properties.)

Humphrey, A.J. and Beale, M.H. 2006. Strigol: biogenesis and physiological activity. Phytochemistry 67: 636-640. (Reviewing recent work on biosynthesis and mode of action of strigolactones, and suggesting that they may be more widely distributed and have a greater physiological significance than has hitherto been appreciated.)

Hunsberger, L.K., Autio, W.R., DeMoranville, C.J. and Sandler, H.A. 2006. Mechanical removal of summer dodder infestations and impacts on cranberry yield. HortTechnology 16(1): 78-82. (Partial removal of *Cuscuta gronovii* from cranberry (*Vaccinium macrocarpon*) with bamboo rakes reduced weed cover substantially but had less effect on total parasite biomass and no beneficial effect on crop yield.)

Idžojtic, M., Pernar, R., Lisjak, Z., Zdelar, H. and Ančic, M. 2005. (Hosts of yellow mistletoe (*Loranthus europaeus* Jacq.) and intensity of infestation in the area of the forest administration Požega.) (in Croatian) Šumarski List 129(1/2): 3-17. (A survey recorded *L. europaeus* most commonly on *Quercus petraea*, also on *Q. robur, Q. pubescens* and *Q. frainetto,* least on *Q. cerris* and not at all on *Q. rubra* or *Castanea sativa.*)

Imoru, J.O., Eno, A.E., Unoh, F.B., Nkanu, E.E., Ofem, O.E. and Ibu, J.O. 2005. Haematopoietic agent(s) in the crude extract from the leaves of *Viscum album* (Mistletoe). Nigerian Journal of Health and Biomedical Sciences 4(2): 139-145. (Crude extract from leaves of *V. album* stimulated haematopoietic cells in normal, hypertensive and diabetic rats, and could perhaps be used in anaemic conditions.)

Iuoras, M., Stanciu, D., Ciucă, M., Năstase, D. and Geronzi, F. 2004. Preliminary studies related to the use of marker assisted selection for resistance to *Orobanche cumana* Wallr. in sunflower. Romanian Agricultural Research 21: 33-37. (Describing efforts to find RAPD and SSR markers associated with the *Or5* resistance trait.)

Janjic, V., Marisavljevic, D. and Pavlovic, D. 2005. (Dodder and its control.) (in Serbian) Biljni Lekar (Plant Doctor) 33: 590-595. (Noting the increasing importance of *Cuscuta trifolii* and *C. campestris* in lucerne and red clover in Serbia, the differences between the two species, and some methods of control.)

Jeet Ram, Beena Tewari and Chanda Pant. 2006. Infestation of oak trees by the flowering parasite (*Taxillus vestitus* (Wall.) Danser) at Nainital in Uttaranchal. Current Science 90: 562-563. (Occurrence of *T. vestitus* on *Quercus leucotrichophora* and *Q. floribunda* was greatest on older trees on disturbed sites, perhaps due to lopping of the trees.)

Karadžic, D., Lazarov, V. and Milenkovic, M. 2004. The most significant parasitic and saprophytic fungi on

common mistletoe (*Viscum album* L.) and their potential application in biocontrol. Glasnik Šumarskog Fakulteta, Univerzitet u Beogradu 89: 115-126. (Recording a total 22 species of fungus on *Arceuthobium oxycedri*, *Loranthus europaeus* and *Viscum album* in Serbia, among which *Botryosphaeria dothidea* causes leaf spot on many trees and shrubs, while *Gibberidea visci* and *Sphaeropsis visci* occur on *V. album,* the latter considered to be of potential interest for biocontrol.)

Kenaley, S., Howell, B. and Mathiasen, R. 2006. First report of *Cladocolea cupulata* on *Pinus douglasiana* and *P. herrerai* in northern Mexico. Plant Disease 90: 681. (*C. cupulata* (Loranthaceae) caused little apparent damage to host trees.)

Konstantinovic, B. and Meseldžija, M. 2005. (Weeds in alfalfa and clover fields and their control.) (in Serbian) Biljni Lekar (Plant Doctor) 33: 595-599. (Noting the economic significance of *Cuscuta* (unspecified) in lucerne in Serbia.)

Krasnoborov, I.M. and Malyschev, L.I. (eds) 2003. Flora of Siberia. Volume 5: Salicaceae-Amaranthaceae. Enfield, USA: Science Publications Inc. 305 pp. (Including family Santalaceae).)

Kunwar, R.M., Adhikari, N. and Devkota, M.P.. 2005. Indigenous use of mistletoes in tropical and temperate regions of Nepal. Banko Jankari. 15(2): 49-53. (The paper discusses the traditional uses in Nepal of *Helixanthera ligustrina, Dendrophthoe falcata, Macrosolen cochinchinensis, Loranthus ororatus, Taxillus vestitus,* and 3 species each of *Scurrula* and *Viscum*.)

Kureh, I., Alabi, S.O. and Kamara, A.Y. 2005. Response of soybean genotypes to *Alectra vogelii* infestation under natural field conditions. Tropicultura 23: 183-189. (Among 22 soyabean genotypes tested in N. Nigeria, 16 showed apparent resistance, 4 were susceptible, and two (SAMSOY2 and TGX1485-1D) were apparently tolerant, yielding well even when heavily infested.)

Kusumoto, D., Chae SangHeon, Mukaida, K., Yoneyama, K., Yoneyama, K., Joel, D.M. and Takeuchi, Y. 2006. Effects of fluridone and norflurazon on conditioning and germination of *Striga asiatica* seeds. Plant Growth Regulation 48: 73-78. (Fluridone and norflurazon shortened the conditioning period for *S. asiatica* and prevented the inhibitory effects of light and of supra-optimal temperature on germination. They also stimulated germination after normal conditioning, while fluridone also promoted haustorial initiation. Diflufenican proved inactive in these respects.)

Lamien, N., Boussim, J.I., Nygard, R., Ouédraogo, J.S., Odén, P.C. and Guinko, S. 2006. Mistletoe impact on Shea tree (*Vitellaria paradoxa* C.F. Gaertn.) flowering and fruiting behaviour in savanna area from Burkina Faso. Environmental and Experimental Botany 55(1/2): 142-148. (Careful measurements of the growth and yield of un-infested branches of *V. paradoxa*, and those infested by mistletoes *Agelanthus* (=*Tapinanthus*) *dodoneifolius*, *Tapinanthus globiferus* and *T. ophioides* failed to detect significant effects on yield of fruit. Possible reasons are discussed.)

Lanini, W.T. and Kogan, M. 2005. Biology and management of *Cuscuta* in crops. Ciencia e Investigación Agraria 32(3): 165-179. (Reviewing cultural and chemical control methods for *Cuscuta* and noting that the parasite is not readily controlled by use of herbicide in herbicide-resistant crops.)

Leake, J.R. 2005. Plants parasitic on fungi: unearthing the fungi in myco-heterotrophs and debunking the 'saprophytic' plant myth. Mycologist 19(3): 113-122. (This review describes the diversity of plants that derive all or part of their nutrition through living fungal networks, and dismisses the notion that any plant species are themselves saprophytic.)

Lehtonen, P., Helander, M., Wink, M., Sporer, F. and Saikkonen, K. 2005. Transfer of endophyte-origin defensive alkaloids from a grass to a hemiparasitic plant. Ecology Letters 8: 1256-1263. (A study of interactions between *Rhinanthus serotinus, Lolium pratense. Festuca pratensis,* the symbiotic endophytic fungus *Neotyphodium uncinatum* and the aphid *Aulacorthum solani.* Showing that uptake of defensive mycotoxins from the endophyte-infected host grass enhances the resistance of the hemiparasitic plant to the aphid, increasing the parasite's vigour and in turn reducing that of the grass host.)

Liovic, B. and Županic, M. 2005. (Forest pests in National Parks of Croatia and ecologically acceptable protective measures.) (in Croatian) Radovi-Šumarski Institut Jastrebarsko 40(1): 101-112. (A mistletoe species (unspecified) is listed among significant pests of Croatian forests.)

López-Curto, L., Márquez-Guzmán, J. and Díaz-Pontones, D.M. 2006. Invasion of *Coffea arabica* (Linn.) by *Cuscuta jalapensis* (Schlecht): in situ activity of peroxidase. Environmental and Experimental Botany 56(2): 127-135. (Emphasising and discussing the importance of peroxidase in the penetration of the outer host tissues by the *Cuscuta* haustorium. Also referring to the probable participation of free radicals in the invasion process.)

Lye, D. 2006. Charting the isophasic endophyte of dwarf mistletoe *Arceuthobium douglasii* (Viscaceae) in host apical buds. Annals of Botany 97: 953-963. (Using novel techniques to demonstrate that the endophyte of *A. douglasii* is much more extensive in the host, *Pseudotsuga menziesii* than previously realised, reaching into dormant buds from which it is able to infect and develop in the following season's growth.)

Mackes, K., Shepperd, W. and Jennings, C. 2005. Evaluating the bending properties of clear wood specimens produced from small-diameter ponderosa pine trees. Forest 55(10): 72-80. (Reporting some significant reduction in elasticity in timber from *Pinus ponderosa* trees infected by *Arceuthobium vaginatum*.)

Mahadevappa, S.G. and Murthy, V.B.B. 2005. Studies on the efficacy of trifluralin and imazethapyr for weed control in lucerne. Indian Journal of Weed Science 37(1/2): 135-136. (*Cuscuta* (unspecified) emergence was inhibited in plots treated with imazethapyr applied pre-emergence or early post-emergence.)

Mariam, E.G. and Suwanketnikom, R. 2004. Effect of nitrogen fertilizers on branched broomrape (*Orobanche ramosa* L.) in tomato (*Lycopersicon esculentum* Mill.). Kasetsart Journal, Natural Sciences 38: 311-319. (In pot experiments in Ethiopia, rates of urea, ammonium sulphate and ammonium nitrate up to 276 kg/ha and goat manure up to 30 t/ha reduced *O. ramosa* and improved tomato yield but highest rates of ammonium salts caused some crop damage.)

Mariam, E.G. and Suwanketnikom, R. 2004. Screening of tomato (*Lycopersicon esculentum* Mill.) varieties for resistance to branched broomrape (*Orobanche ramosa* L.). Kasetsart Journal, Natural Sciences 38: 434-439. (In pot experiments in Ethiopia, a number of tomato varieties showed partial resistance, supporting 7-13 rather than 31-33 shoots of parasite, as in the most susceptible varieties Caribe and Floradade, but yields were still reduced. A variety 'South Africa' showed some degree of tolerance.)

Mathiasen, R., Beatty, J.S. and Pronos, J. 2002. Pinyon pine dwarf mistletoe. Forest Insect & Disease Leaflet No.174, 7 pp. (Describing the life history, spread, impact and management of *Arceuthobium divaricatum* on *Pinus monophylla* and *P. edulis*.)

Mathiasen, R. and Melgar, J. 2006. First report of *Arceuthobium hondurense* in Department El Paraiso, Honduras. Plant Disease 90: 685. (Commonly parasitizing *Pinus oocarpa*.)

Mauseth, J.D., Benigno, S., Huamani, F.C. and Ostolaza, C. 2006. A mistletoe that attacks cacti: *Ligaria cuneifolia* infects *Corryocactus brevistylus*. Cactus and Succulent Journal 78(2): 88-91. (Discussing the mode of infection of *L. cuneifolia* (Loranthaceae) on *C. brevistylus*.)

Mayer, A.M. 2006. Pathogenesis by fungi and by parasitic plants: similarities and differences. Phytoparasitica 34: 3-16. (A review, cautioning that while many superficial similarities exist between pathogenesis by fungi and parasitic plants, the differences are far greater. Parasitic plants have many unique features.)

McDonald, G.I., Richardson, B.A., Zambino, P.J., Klopfenstein, N.B. and Kim, M.S. 2006. *Pedicularis* and *Castilleja* are natural hosts of *Cronartium ribicola* in North America: a first report. Forest Pathology 36(2): 73-82. (Presenting evidence for *P. racemosa* and *C. miniata* behaving as alternate hosts of the pine blister rust, *C. ribicola*, as well as *Ribes* spp.)

Mehltreter, K., Flores-Palacios, A. and García-Franco, J.G. 2005. Host preferences of low-trunk vascular epiphytes in a cloud forest of Veracruz, Mexico. Journal of Tropical Ecology 21: 651-660. (Comparing the epiphytic species occurring on tree ferns and on angiosperm trees. Believed to include some mistletoes but none mentioned in the abstract.)

Menkir, A. 2006. Assessment of reactions of diverse maize inbred lines to *Striga hermonthica* (Del.) Benth. Plant Breeding 125: 131-139. (Sixteen new inbred lines of maize supported significantly fewer attached parasites compared with the susceptible inbred check.)

Menkir, A., Kling, J.G., Badu-Apraku, B. and Ibikunle, O. 2006. Registration of 26 tropical maize germplasm lines with resistance to *Striga hermonthica.* Crop Science 46: 1007-1009. (Describing the development of 17 inbred lines (TZSTRI101 to 117) suitable for lowlands, based partly on *Zea diploperennis*, and a further 9 lines (TZSTRI118-126) for mid-altitudes. The lowland lines also incorporate resistance to southern corn leaf, southern corn rust and maize streak virus, while mid-altitude lines have resistance to northern leaf blight.)

Michalewska, A. 2004. (New locality of *Orobanche flava* (Orobanchaceae) in the San River Valley (Sandomierz Basin).) (in Polish) Fragmenta Floristica et Geobotanica Polonica 11: 424-426. (Recording *O. flava* on *Petasites hybridus*.)

Miller, M.R., White, A. and Boots, M. 2006. The evolution of parasites in response to tolerance in their hosts: the good, the bad, and apparent commensalism. Evolution 60: 945-956. (No reference to parasitic plants but this thoughtful analysis is fully relevant to them.)

Motti, R. and Ricciardi, M. 2005. (The flora of the Phlegrean Fields (Gulf of Pozzuoli, Campania, Italy).) (in Italian) Webbia 60: 395-476. (In a survey, 748 taxa were recorded, including *Orobanche arenaria*, a new record.)

Mousavi, A. 2005. Walnut as new host for mistletoe *Viscum album* in Zandjan province. Iranian Journal of Forest and Range Protection Research 3(1): 91-95, 105. (In this province of Iran *Arceuthobium oxycedri* is an important cause of die-back in *Juniperus excelsa*, while *V. album* is recorded on a range of hosts including walnut, *Juglans regia*.)

Mueller, R.C. and Gehring, C.A. 2006. Interactions between an above-ground plant parasite and below-ground ectomycorrhizal fungal communities on pinyon pine. Journal of Ecology (Oxford) 94: 276-284. (Pinyon pine (*Pinus edulis*) infected by *Arceuthobium divaricatum* had lower shoot growth. Higher mistletoe infestation was associated with higher ectomycorrhizal colonization, a shift in the dominance of ascomycete fungi, increased fungal inoculum under the crowns of the host, and increased numbers of pine seedlings.)

Nekouam, N., Marley, P.S., Emechebe, A.M. and Akpa, A.D. 2006. Development and assessment of *Fusarium oxysporum*-based mycoherbicide for control of *Striga hermonthica* in sorghum. Archives of Phytopathology and Plant Protection 39(3): 197-203. (In greenhouse evaluations the most effective formulation for application of *F. oxysporum* involved rock phosphate as the carrier with gum arabic powder as a sticking agent.)

Nelson, D.A. 2005. Evaluation of *Penstemon* as host for *Castilleja* in garden or landscape. Native Plants Journal 6: 254-262. (Confirming *P. strictus* to be a suitable host for *Castilleja integra* and *C. indivisa* but noting that the micro-environment may need to be balanced for best results.)

Nun, N.B. and Mayer, A.M. 2005. Smoke chemicals and coumarin promote the germination of the parasitic weed *Orobanche aegyptiaca.* Israel Journal of Plant Sciences 53(2): 97-101. (Water that had been exposed to smoke stimulated seed germination nearly as well as GR24. Coumarin stimulated germination, but inhibited radicle growth.)

Obiang, N.L.E. and Sallé, G. 2006. (Is there any point in eradicating *Phragmanthera capitata* parasitizing African rubber trees?) (in French) Comptes Rendus Biologies 329(3): 185-195. (A study on three clones of rubber suggested that parasitism by *P. capitata* had no significant effect on latex yield.)

Osadebe, P.O. and Akabogu, I.C. 2006. Antimicrobial activity of *Loranthus micranthus* harvested from kola nut tree. Fitoterapia77(1): 54-56. (Extracts in various solvents were obtained from *L. micranthus* in Nigeria. A methanol extract showed the best activity against *Escherichia coli* and *Bacillus subtilis* while a petroleum ether extract showed best antifungal action.)

Ouyang Jie, Wang XiaoDong, Zhao Bing and Wang YuChun 2005. Enhanced production of phenylethanoid glycosides by precursor feeding to cell culture of *Cistanche deserticola*. Process Biochemistry 40: 3480-3484. (The production of phenylethanoid glycosides was enhanced by adding pre-cursors phenylalanine, l-tyrosine, sodium acetate and phenylacetic acid to cell cultures. Phenylalanine could increase production by 75%.)

Păcureanu-Joita, M., Stanciu, D., Petcu, E., Raranciuc, S. and Sorega, I. 2005. Sunflower genotypes with high oleic acid content. Romanian Agricultural Research 22: 23-25. (Selective breeding program identified lines that have improved oil quality and resistance to *O. cumana*.)

Page, T., Tate, H., Tungon, J., Sam, C., Dickinson, G., Robson, K., Southwell, I., Russell, M., Waycott, M. and Leakey, R. 2006. Evaluation of heartwood and oil characters in nine populations of *Santalum austrocaledonicum* from Vanuatu. Sandalwood Research Newsletter 21: 4-7. (*S. austrocaledonicum* is native to Vanuatu and is an important source of income. Broad sampling across six islands showed wide variation in sandalwood oil yield and quality. The results will contribute to a programme of domestication aimed at diversifying the genetic base, reducing pressure on depleted natural resources and enhancing local livelihoods.)

Pawlikowski, P. 2005. (A new station of *Lathyrus pisiformis* (Fabaceae) in the Lithuanian Lake District.) (in Polish) Fragmenta Floristica et Geobotanica Polonica 12(1): 168-171. (Incidentally noting concern for the rare *Thesium ebracteatum*, being threatened by growth of shrubs.)

Perez de Luque, A., Rubiales, D., Cubero, J.I., Press, M.C., Scholes, J.,Yoneyama, K., Takeuchi, Y., Plakhine, D. and Joel, D.M. 2005. Interaction between *Orobanche crenata* and its host legumes: unsuccessful haustorial penetration and necrosis of the developing parasite. Annals of Botany 95: 935-942. (Concluding from detailed microscopy that the unsuccessful penetration of *O. crenata* into legume roots cannot be attributed to cell death in the host but is mainly associated with lignification of host endodermis and pericycle cells at the penetration site.)

Pérez-de-Luque, A., Lozano, M.D., Cubero, J.I., González-Melendi, P., Risueño, M.C. and Rubiales, D. 2006. Mucilage production during the incompatible interaction between *Orobanche crenata* and *Vicia sativa*. Journal of Experimental Botany 57: 931-942. (Mucilage and other substances secreted by the parasite block host vessels and obstruct the parasite supply channel, thus contributing to failure of the parasite on resistant *V. sativa*.)

Pérez-de-Luque, A., González-Verdejo, C.I., Lozano, M.D., Dita, M.A., Cubero, J.I., González-Melendi, P., Risueño, M.C. and Rubiales, D. 2006. Protein cross-linking, peroxidase and β-1,3-endoglucanase involved in resistance of pea against *Orobanche crenata*. Journal of Experimental Botany 57: 1461-1469. (In resistant wild relatives of pea, development of *O. crenata* was stopped in the host cortex. Accumulation of hydrogen peroxide, peroxidases, and callose were detected in neighbouring cells, apparently associated with protein cross-linking in the host cell walls. A peroxidase and a β-1,3-glucanase are differently expressed in cells of the resistant host.)

Procházka, F. 2005. (Distribution of *Viscum album* subsp. *album* on different host trees in the center of its occurrence distribution near Nová Hospoda location (distr. Písek, South Bohemia).) (in Czech) Sborník Jihočeského Muzea v Českých Budýjovicích, Přírodní Vědy 45: 61-69. (Careful recording of tree hosts revealed lower numbers of host spp. towards the edges of the distribution of *V. album*.)

Pryme, I.F., Bardocz, S., Pusztai, A. and Ewen, S.W.B. 2006. Suppression of growth of tumour cell lines *in vitro* and tumours *in vivo* by mistletoe lectins. Histology and Histopathology 21(1/3): 285-299. (Providing supporting evidence that mistletoe lectins from both European and Korean *Viscum* spp. are able to induce an anti-angiogenic response in the host suggesting that the anti-metastatic effect observed on a series of tumour cell lines in mice is in part due to an inhibition of tumour-induced angiogenesis and in part due to an induction of apoptosis.)

Pujadas Salva, A.J., Rubiales Olmedo, D. and López Martinez, M. 2005. (*Orobanche* L. (Orobanchaceae) Sect. *trionychon* Wallr. in Andalucia: *Orobanche rosmarina* Beck.) (in Spanish) Acta Botanica Malacitana 30: 49-54. (Describing the chorology and habitat of the Andalusian specimens of *Orobanche rosmarina* and providing new identification keys.)

Pusz, W. 2005. (Mycoherbicides, or the possibility of utilizing fungi for restricting weed infestations.) (in Russian) Ochrona Roślin 50(11): 30-32. (A brief history of biological weed control, including mention of the use in the former Soviet Union of *Alternaria* to control *Cuscuta* spp.)

Qasem, J.R. 2006. Recent advances in parasitic weed research: an overview. In: Singh, H.P., Batish, D.R. and Kohli, R.K. (eds) Handbook of sustainable weed management, pp. 627-769. (A general review covering *Orobanche, Cuscuta, Viscum, Loranthus, Osyris, Cistanche* and *Cynomorium* spp.)

Radi, A., Dina, P. and Guy, A. 2006. Expression of *sarcotoxin IA* gene via a root-specific *tob* promoter enhanced host resistance against parasitic weeds in tomato plants. Plant Cell Reports 25: 297-303. (Transgenic tomato plants expressing the sarcotoxin gene from an insect showed strong inhibition of *Orobanche aegyptiaca* growth and significantly increased yield as compared with non-transgenic ones.)

Regnault-Roger, C., Fabres, G. and Philogène, B.J.R. 2005. (Phytosanitary concerns for agriculture and the environment.) (in French) In: Regnault-Roger, C. (ed.) Enjeux phytosanitaires pour l'agriculture et l'environnement, Paris, France: Editions Tec & Doc, 1013 pp. (Including chapters on parasitic plants and case studies in Senegal and North Africa.)

Rietman, L.M., Shamoun, S.F. and van der Kamp, B.J. 2005. Assessment of *Neonectria neomacrospora* (anamorph *Cylindrocarpon cylindroides*) as an inundative biocontrol agent against hemlock dwarf mistletoe. Canadian Journal of Plant Pathology 27: 603-609. (An inoculum of *N. neomacrospora* applied to swellings on *Tsuga heterophylla* caused by *Arceuthobium tsugense* caused significant reduction in parasite shoots when swellings were first 'wounded' but had little effect when they were not.)

Rodenburg, J., Bastiaans, L., Kropff, M.J. and van Ast, A. 2006. Effects of host plant genotype and seedbank density on *Striga* reproduction. Weed Research 46: 251-263. (Studying the influences of crop variety on seed production of *Striga hermonthica* and concluding that, although cultivars such as N13, IS9830 and SRN39 greatly reduce seed production, only at very low infestation levels would the use of these varieties alone lead to a reduced seed-bank.)

Ross, C.M. and Sumner, M.J. 2005. Early endosperm and embryo development of the dwarf mistletoe *Arceuthobium americanum* (Viscaceae). International Journal of Plant Sciences 166: 901-907. (Embryology in parasitic plants has long drawn attention because of the extreme reduction in the embryo sac of holoparasites. The development of a cell wall from vesicles as the zygote dislodged from the embryo sac has not previously been reported in angiosperms though the relationship of this phenomenon to parasitic plants is not clear.)

Roy, B., Alam, M.R., Sarker, B.C., Rahman, M.S., Islam, M.J., Hakim, M.A. and Mahmood, R.I. 2006. Effect of aqueous extracts of some weeds on germination and growth of wheat and jute seeds with emphasis on chemical investigation. Journal of Biological Sciences 6(2): 412-416. (Crude extracts of *Striga densiflora* inhibited wheat and jute growth.)

Rubiales, D., Pérez-de-Luque, A., Fernández-Aparico, M., Sillero, J.C., Román, B., Kharrat, M. Khalil, S., Joel, D.M. and Riches, C.R. 2006. Screening techniques and sources of resistance against parasitic weeds in grain legumes. Euphytica 147: 187-199. (A detailed and thoughtful review of screening techniques in relation to pathogen variation and sources of resistance, primarily in respect of grain legumes but of potential relevance also to cereals. Concluding that combination of different resistance mechanisms into a single cultivar can provide durable field resistance, and that this can be achieved by the use of *in vitro* screening methods combined with marker-assisted selection techniques.)

Rubiales, D., Moreno, M.T. and Sillero, J.C. 2005. Search for resistance to crenate broomrape (*Orobanche crenata* Forsk.) in pea germplasm. Genetic Resources and Crop Evolution 52: 853-861. (Screening of 575 accessions of pea against *O. crenata* yielded no complete resistance and the quantitative resistance observed was highly influenced by environmental conditions. This could be sufficient to prevent damage in 'normal' years but not in others.)

Sánchez-Arreola, E., Maiti, R.K. and Trujillo-Pérez, B. 2004. Morpho-anatomical characters and secondary metabolites from *Psittacanthus calyculatus* (Loranthaceae). Phyton (Buenos Aires) 2004: 119-121. (Alkaloids, saponins and terpenes were detected in extracts from *P. calyculatus* but none showed antimicrobial activity.)

Serafini, M., Corazzi, G., Poli, F., Piccin, A., Tomassini, L. and Foddai, S. 2005. Phenylpropanoid glycosides in Italian *Orobanche* spp., sect. *Orobanche*. Natural Product Research 19: 547-550. (Orobanchoside and verbascoside were both detected in *O. gracilis* (typical form*), O. teucrii, O. alba* and *O. caryophyllacea* but not in *O. gracilis* f. *citrina*.)

Shen, H., Ye, W., Hong, L., Huang, H., Wang, Z., Deng, X., Yang, Q. and Xu, Z. 2006. Progress in parasitic plant biology: host selection and nutrient transfer. Plant Biology 8(2): 175-185. (A general review.)

Simier, P., Constant, S., Degrande, D., Moreau, C., Robins, R.J., Fer, A. and Thalouarn, P. 2006. Impact of nitrate supply in C and N assimilation in the parasitic plant *Striga hermonthica* (Del.) Benth (Scrophulariaceae) and its host *Sorghum bicolor* L. Plant, Cell and Environment 29: 673-681. (Demonstrating that sorghum tolerates much higher levels of nitrate than *S. hermonthica.* The latter copes with lower levels of N by converting it to asparagine, but is seriously damaged by higher levels, above 500 mg N per host plant.).

Sonwa, D.J., Weise, S., Adesina, A., Nkongmeneck, A.B., Tchatat, M. and Ndoye, O. 2005. Production constraints on cocoa agroforestry systems in West and Central Africa: the need for integrated pest management and multi-institutional approaches. Forestry Chronicle 81: 345-349. (Loranthaceae listed among 'lesser' pests of cocoa in Southern Cameroon.)

Spurrier, S.E. and Smith, K.G. 2006. Watering blue palo verde (*Cercidium floridum*) affects berry maturation of parasitic desert mistletoe (*Phoradendron californicum*) during an extreme drought in the Mojave Desert. Journal of Arid Environments 64: 369-373. (Watering did not increase berry numbers of *P. californicum* but allowed them to mature. Excess (x 10) watering had no increased effect.)

Stanton, S. 2006. The differential effects of dwarf mistletoe infection and broom abundance on the radial growth of managed ponderosa pine. Forest Ecology and Management 223: 318-326. (Concluding that in the case of *Arceuthobium campylopodium* infections on *Pinus ponderosa* the occurrence of brooms causes no consistent reduction in radial growth of the trees, and their removal may have no economic benefit, while reducing wildlife habitat.)

Surayya Khatoon, Ali, Q.M. and Imran, M. 2005. Studies on the plant biodiversity of Hub river estuary. International Journal of Biology and Biotechnology 2: 853-861. (Recording *Aeluropus lagopoides* and a *Sporobolus* sp. as new hosts of *Cistanche tubulosa* in Pakistan.)

Tate, H., Sethy, M., and Tungon, J. 2006. Grafting sandalwood in Vanuatu. Sandalwood Research Newsletter 21: 7. (Describing the successful use of grafting for the propagation of high quality stock of (presumably) *Santalum austrocaledonicum* (see Page *et al.* above).)

Touré, M.A. and Singh, B.B. 2005. Registration of 'Korobalen' cowpea. Crop Science 45: 2648-2649. (The new variety Korobalen has resistance to aphids, to a range of diseases, and to the Malian strain of *Striga gesnerioides*.)

Touré, M.A. and Singh, B.B. 2005. Registration of 'Sangaraka' cowpea. Crop Science 45: 2648. (The new variety Sangaraka has resistance to aphids, to a range of diseases and to both *Striga gesnerioides* and *Alectra vogelii*. It also stimulates germination of *Striga hermonthica*.)

Tyšer, L., Hamouz, P., Nováková, K. and Brant, V. 2005. Species richness and weed composition of agrophytocenoses in selected agricultural companies with conventional and organic farming systems. Herbologia 6(3): 1-7. (Recording the occurrence of *Odontites verna* on organic farms in the Czech Republic.)

van Ast, A. 2006. The influence of time and severity of *Striga* infection on the *Sorghum bicolor-Striga hermonthica* association. Tropical Resource Management Papers 77. 153 pp. (The published version of a PhD thesis. See under Theses for Abstract)

van Ast, A. and Bastiaans, L. 2006. The role of infection time in the differential response of sorghum cultivars to *Striga hermonthica* infection. Weed Research 46: 264-274. (Confirming that infection by *S. hermonthica* tends to be earlier on the susceptible variety CK-60B than on the tolerant Tiemarifing, also that artificially delaying infection significantly reduces damage to the susceptible variety, and suggesting ways in which such a delay might be achieved in the field.)

van Ast, A., Bastiaans, L. and Katile, S. 2005. Cultural control measures to diminish sorghum yield loss and parasite success under *Striga hermonthica* infestation. Crop Protection 24: 1023-1034. (Deep planting, the use of transplants, and shallow soil-tillage strongly delayed and reduced *Striga* infection and improved crop growth in pot experiments but not in the field. Possible reasons are discussed.)

Vasey, R.A., Scholes, J.D. and Press, M.C. 2005. Wheat (*Triticum aestivum)* is susceptible to the parasitic angiosperm *Striga hermonthica,* a major cereal pathogen in Africa. Phytopathology 95: 1294-1300. (In spite of the rarity of reports of *Striga* occurrence on wheat in the field, this study confirmed that modern cultivars of wheat, Hereward and Chablis, and a range of ancestral *Triticum* and *Aegilops* spp., all supported the germination and development of *S. hermonthica* and were severely damaged by it.)

Vericad, M., Stafforini, M. and Torres, N. 2003. (Floristic records from the Balearic Islands (XVII).) (in Spanish) Bolletí de la Societat d'Història Natural de les Balears

46: 145-151. (*Orobanche clausonis* is listed as a 'novelty' on the island of Eivissa.)

Voitsekhovskaja, O.V., Koroleva, O.A., Batashev, D.R., Knop C., Tomos, A.D., Gamalei, Y.V., Heldt, H-W. and Lohaus, G. 2006. Phloem loading in two Scrophulariaceae species. What can drive symplastic flow via plasmodesmata? Plant Physiology 140: 383-395. (No mention of parasitic plants but of potential interest, especially as it involves species of Scrophulariaceae/Orobancheaceae.)

Vrânceanu, A.V., Stanciu, D.. Stanciu, M., Păcureanu-Joita, M., Sorega, I. and Mantu, I. 2005. Jupiter - a new *Orobanche* resistant sunflower hybrid. Romanian Agricultural Research 22: 19-22. (Recommending Jupiter as a variety with good agronomic properties including resistance to *O. cumana*.)

Vurro, M., Boari, A., Pilgeram, A.L. and Sands, D.C. 2006. Exogenous amino acids inhibit seed germination and tubercle formation by *Orobanche ramosa* (broomrape): potential application for management of parasitic weeds. Biological Control 36: 258-265. (Reporting that 2 mM methionine almost totally suppressed germination of *Orobanche ramosa* and suggesting ways in which this observation might be exploited.)

Weiss-Schneeweiss, H., Greilhuber, J. and Schneeweiss, G.M. 2006. Genome size evolution in holoparasitic *Orobanche* (Orobanchaceae) and related genera. American Journal of Botany 93: 148-156. (Reporting chromosome numbers for many species. Basic numbers correspond to taxonomic groups: Sect. Orobanche having n=19, and sects. Trionychon, Myzorrhiza, and Gymnocaulis having n=12 and multiples.)

Westbury, D.B. and Davies, A. 2005. Yellow rattle – its natural history and use in grassland diversification. British Wildlife 17(2): 93-98. (A useful review of the biology of *R. minor* and the history of its fall and rise in popularity as a grassland species. Concluding that, although its efficacy in increasing species diversity is complex, depending on site specifics, it can be a useful agent for positive change in species-rich grassland restoration.)

Wilson, C.A. and Calvin, C.L. 2006. Character divergences and convergences in canopy-dwelling Loranthaceae. In: DeMason, D.A. and Hirsch, A.M. (eds) Botanical Journal of the Linnean Society 150(1): 101-113. (Comparing gene sequence – nuclear ITS and chloroplast *trnL-trnF* – and chromosome number data to morphological characteristics. The traits of habitat (terrestrial vs. aerial) and haustorial type show considerable convergence across evolutionary lineages.)

Wilson, C.A. and Calvin, C.L. 2006. An origin of aerial branch parasitism in the mistletoe family, Loranthaceae. American Journal of Botany 93: 787-796. (Presenting molecular and morphological evidence that the root-parasitic *Nuytsia floribunda* is ancestral to the family; that aerial parasitism has had multiple origins; that the first aerial parasities had epicortical roots; and that the origin of aerial parasitism in one Old World clade involved epiphytic growth following germination on tree branches, without any climbing intermediate.)

Wisler, G.C. and Norris, R.F. 2005. Symposium: interactions between weeds and cultivated plants as related to management of plant pathogens. Weed Science 53: 914-917. (Noting the role of *Cuscuta* spp. in the spread of pathogens such as cucumber mosaic virus.)

Wu, X.M. and Tu, P.F. 2005. Isolation and characterization of α-(1 → 6)-glucans from *Cistanche deserticola.* Journal of Asian Natural Products Research 7: 823-828. (NaOH extracts of *C. deserticola* yielded 3 unique glucan-based polysaccharides, their structures differing from that of linear starch.)

Yonli, D., Traoré, H., Hess, D.E., Sankara, P. and Sérémé, P. 2006. Effect of growth medium, *Striga* seed burial distance and depth on efficacy of *Fusarium* isolates to control *Striga hermonthica* in Burkina Faso. Weed Research 46: 73-81. (In pot experiments a range of isolates of '*Fusarium* spp.', *F.equiseti* and *F. oxysporum* (34-Fo) grown on compost or on chopped sorghum straw and mixed into the top 5 cm of sterilised soil all reduced *Striga* emergence and increased sorghum growth, but compost proved superior. The inocula were somewhat less effective against *Striga* buried at 10 cm, than at 5 cm depth. Isolate 34-Fo gave best results.)

Yüksel, B., Akbulut, S. and Keten, A. 2005 (The damage, biology and control of pine mistletoes (*Viscum album* ssp. *austriacum* (Wiesb.) Vollman).) (in Turkish) Orman Fakultesi Dergisi Series A (Faculty of Forestry Journal) 2005(2): 111-124. (A general review of information on *V. album*, an important problem in coniferous forests in Turkey.)

HAUSTORIUM 49
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9TH WORLD CONGRESS ON PARASITIC PLANTS

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Please indicate which of the following areas would be your primary choice:

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