HAUSTORIUM

Parasitic Plants Newsletter

Official Organ of the International Parasitic Seed Plant Research Group

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• • SIXTH INTERNATIONAL PARASITIC WEED SYMPOSIUM 1996

The next symposium is tentatively scheduled for **1996** in Cordoba, Spain. If you are interested in attending, fill out the enclosed insert and mail directly to the address on the insert. The first circular is scheduled for mailing in September **1993.** For further information contact:

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• THIRD INTERNATIONAL WORKSHOP ON OROBANCHE

Held in Amsterdam **8-12** November **1993,** the workshop had about **100** delegates from **23** countries who enjoyed an excellent third Orobanche workshop in the impressive surroundings of the Royal Tropical Institute. Sixty papers and 30 posters covered many aspects of both Orobanche and Striga. After introductory papers contributions on the basic biology and taxonomy of Orobanche included observations on the evolution of the Orobanchaceae as deduced from the plastid genome (Thalouarn). There was repeated discussion of the taxonomic status of ***O.cernua*** v. ***O.*** cumana and ***O.***ramosa v. ***O.aegyptiaca*** but no resolution. Techniques based on pollen morphology (Abu Sbaiah) and chemotaxonomy (Andary) had been used to confirm distinctions between the sections Trinychon and Orobanche (Osproleon) of the genus but not for separating the species within them. The conditioning and germination processes of ***O.aegyptiaca*** were described in new detail (Mayer); a new in vitro technique for growing host roots should throw useful light on stimulant exudation (Croes); and the importance of primary and secondary dormancy was discussed (Pieterse). There were also new studies on the precise role of ethylene in Striga germination (Babiker; Fer; Thuring). For the latter study an elegant new ethylene-detection technique had been used. Ethylene is not apparently involved in Orobanche germination (Joel; Wegmann). Strigol has now been confirmed as the natural Striga-germinating stimulant from maize and proso millet (Butler). The Orobanche stimulants have still not been fully determined but are increasingly thought also to be members of the strigol family (Wegmann). Two groups have continued work on structure-activity relations of strigol analogues (Zwanwenburg; Welzel). Haustorial initiation in Orobanche remains to be explained but the penetration process into the host was well described (Joel; Doerr; Shomer-Elan; Losner-Goshen). Progress in host crop resistance was reported for sunflower. Workers in Spain (Melero-Vara), Bulgaria (Encheva) and Turkey (Petzoldt) reported development of immunity to all major pathotypes of '***O***cumana' but further pathotypes were expected to develop and there was also a report from Israel of failure of resistance under low temperature conditions (Jacobsohn). There was reiteration of the hypothesis that resistance results from a lignification response in the pericycle (Antonova) but also an alternative suggestion that resistance is expressed primarily by development of **an** isolation layer in the cortex and that lignification is a later secondary effect (Doerr). The possible role of phytoalexins in resistance was discussed (Wegmann). Breeding and selection in faba bean has yielded lines with useful levels of resistance to ***O.***crenata, often combined with relative tolerance, for use in Egypt (Zaitoun; Abdalla; Khalil), and in Spain (Cubero); and with resistance to ***O.***foetida in Tunisia (Kharrat). Among other control measures, new imidazolinone herbicides, especially imazethapyr and imazaquin, show promise not only in

faba bean but also in other legumes such as pea and perhaps in sunflower (Garcia-Torres; Saber; Jacobsohn; Castejon-Munoz). In discussion, however, there was a warning that resistance to this class of herbicides is likely to develop very rapidly (Gressel). Maleic hydrazide is still being used successfully in tobacco in Cuba (Labrada). Mechanical control by 'mini-spear' was again endorsed for use in tobacco (Krishna Murty). There were further encouraging indications of the potential for mycoherbicides based on Fusarium species from China and from Bulgaria and India (Bozoukov; Bedi); also a report of successful biocontrol of Striga hermonthica by *F. nygamai* (Sauerborn). Integrated systems involving rotation, delayed planting etc had been tested in Morocco, Syria and Spain (Kroschel; Schnell; Solh; Lopez-Granados) and useful information obtained on the fate of the seed bank under different regimes. Where fertilizer was being included it was generally assumed to be increasing crop tolerance rather than contributing directly to control. Reports of Orobanche problems and current research in different countries included papers from Chile, Cuba and Sudan, where O. ramosa is a problem in all three countries (Kogan; Labrada; Babiker), also from Bulgaria, Spain, India, Morocco, Tunisia, Egypt, Jordan and Israel. Reports on EC projects included several on *Striga*, from France (Salle; Raynal-Roques; Pari), Benin (Gbehounou), U.K. (Lane), Kenya (Ransom; Odhiambo; Baltus; Kuiper) and Netherlands (Verkleij). Ransom presented the first encouraging results from a longterm trial in which the effects of hand-pulling and other treatments were being monitored for their effects on the *S. hermonthica* seed bank. In a final session of general papers, Dr Gressel presented an authoritative account of the potential for the application of genetic engineering to the problem of parasitic weeds, especially the development of herbicide-resistant crops. The potential had already been proven with crops engineered for resistance to sulphonyl urea and imidazolinone herbicides but he warned that resistance to these two groups is likely to break down rapidly, while that to glyphosate should be more durable. Chris Parker summarized the latest prospects for control and emphasised the need for integrated systems which eliminated or at least minimized the risks of breakdown of crop resistance and/or the development of herbicide resistance in the parasite. Dr Abu-Irmaileh reported on the conclusions from the FAO Orobanche meeting held in Amman, Jordan in October and emphasized the need to reduce the risks of new infestations which arose from careless use of unfermented manure and contaminated crop seed. Dr Labrada also outlined a new FAO proposal for a coordinated Orobanche research programme in the Near East Region. Finally Dr Pieterse announced plans for the creation of a research group on Parasitic Weeds to be set up in the framework of the European Weed Research Society (EWRS) (regrettably since rejected by EWRS - Ed.). Dr Pieterse and his colleagues are to be congratulated on the excellent facilities and organization provided for this workshop. The proceedings are expected to be available in a few months time. Details will be in the next issue of HAUSTORIUM or contact A. H. Pieterse, Royal Tropical Institute, Mauritskade 63, 1092 ED, Amsterdam, The Netherlands.

• *PYRULARIA PUBERA* AS A PATHOGEN OF CHRISTMAS TREES IN WEST VIRGINIA; *THESIUM* IN MONTANA

The Santalaceae is a small family in North America with five genera each with a single species. Although they are all root parasites, there has been no recorded host damage. A sixth genus, Thesium, was reported as a minor weed in the Great Plains several decades ago but has since been extirpated. Recently a species Thesium and a native shrub of the Santalaceae have been reported as weeds. During the 1993 growing season, the West Virginia forest authorities were notified of damage to Abies, Picea, and *Pinus* which are grown in plantations in the Appalachian Mountains of southern West Virginia as Christmas trees. Trees were losing leaves, stems were dying back, and in heavy infestations trees were killed. Examination of the roots revealed white swellings which were assumed to be nematodes but were later determined to be haustoria of an unknown parasitic plant. During a site visit in May, it was determined that the causative agent is the widespread and common Appalachian shrub, *Pyrularia pubera*, known locally as buffalo nut. This is the first report of this genus causing damage anywhere. Control measures are being developed but the strongly rhizomatous nature of the parasite makes control difficult. The genus Thesium has been introduced into the United States on several occasions and a new infestation has been discovered on range land in Montana. The tentative determination of this species is Thesium humile, a documented problem in some grain crops in the Middle East, but the Montana plant remains to be verified as the genus is a large one with considerable taxonomic difficulty.

S. Clark Haynes, West Virginia Department of Agriculture, Charleston, West Virginia 25305-0170 and L. J. Musselman.

● AN IMPORTANT NEW BOOK ON PARASITIC PLANTS

Parasitic Weeds of the World: Biology and Control. C. Parker and C. R. Riches, **1993. 332** pages, **16** plates + **44** Figures. ISBN 0 **85198 873 3.** Price **45** pounds sterling. Available from CAB International Wallingford, Oxon OX10 8DE, UK; North America: 845 North Park Avenue, Tucson, AZ **85719,** USA. Price US $89.50. Copies may be available to developing country institutions at a reduced cost from Technical Centre for Agricultural and Rural Cooperation, P.O. Box **380,** 6700 AJ Wageningen, Netherlands. The book includes 16 colorful high quality plates. In sharp contrast to the plates, most of the nearly **44** line drawings fall short of textbook standard. Still, I found them very helpful in illustrating the general features and morphology. It is divided into *six* chapters: 1- ***Striga*** (9 spp); 2- ***Striga gesnerioides*** and ***Alectra*** (**3** spp); **3-** ***Orobanche*** (6 spp); ***4-*** Other root parasites in Scrophulariaceae, Orobanchaceae, Santalaceae, and Balanophoraceae; **5-** ***Cuscuta*** (**14** spp) and ***Cassytha;*** 6- the Loranthaceae and the Viscaceae. There are keys to species and each species is discussed separately as to its distribution, host range, variation, economic importance, biology and physiology, ecology, and control. The aspect of control has an interesting part to it- recommending different control measures for various levels of parasitic infestation. In addition, each chapter concludes with specific control strategy appropriate to the parasite stressing integrated control measures and improved extension services. The book draws from and integrates the vast literature on the various aspects of parasitic plants that have accumulated in the past **25** years ***(850*** references). Although not in great depth, it is one of the few publications that bring together all the major groups of parasitic plants and address the different aspects of their biology, ecology, physiology, and control. A comprehensive and up-to-date review of the control measures of the economically important parasitic weeds make this book special. Thus it will serve as one of the major sources of information to students and research workers.

Kamal I. Mohamed, Old Dominion University, Norfolk, Virginia.

● *STRIGA* IN COTE D'IVOIRE 1992 AND 1994

A reconnaisance was undertaken in early September **1992** of rice areas north of Boundiali, Korhogo and Ferkessedougou. In the west of this zone S. ***aspera*** is conspicuous among wild grasses and locally as severe infestations in rice and maize. It is also common on "fonio" ***(Digitaria exilis).*** ***Striga hermonthica*** occurs at low densities in rice and maize and associated also with sorghum and grass weeds, especially ***Digitaria horizontalis.*** In the vicinity of Korhogo and Ferkessedougou where S. ***aspera*** appears not to occur, severe infestations of S. ***hermonthica*** were seen in rice, maize, and sorghum. Patches of the yellow flowered morphotype of S. ***asiatica*** were also seen on rice. Further south in the forest/savannah transition zone, we found both red and yellow morphotypes of S. ***asiatica*** parasitic on wild grasses. Farmers had not seen this parasite on rice. ***Striga gesnerioides*** was observed on ***Ipomoea eriocarpa*** near Korhogo. No ***Striga*** was apparent in cowpea and farmers were not aware of the parasite on this crop so it seems likely that this area is south of the range of the cowpea strain of S. ***gesnerioides.*** ***Alectra vogellii,*** on the other hand, is common on peanut in the Korhogo areas with noticeable damage at several sites, The Natural Resources Institute (NRI) is collaborating with the West African Rice Development Association (WARDA) in a search for ***Striga*** resistance for use in rice varieties suitable for savannah areas of West Africa.

C. R. Riches, D. E. Johnson, NRI, UK and R. Diallo, WARDA, Bouake

The results of our survey in mid-October **1993** are quite different from those reported above likely due to a later season. We found only one field of sorghum and maize severely infested with S. ***hermonthica,*** about 70 **km** west of Ferkessedougou. ***Striga brachycalyx*** is abundant in native grasslands. Several other species were found but no S. ***aspera.***

D. M. Berner, International Institute of Tropical Agriculture and L. J. Musselman

● LITERATURE

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