



# HAUSTOKIUM

## PARASITIC PLANTS

### NEWSLETTER

#### OLD DOMINION UNIVERSITY

No. 5

June 1980

#### IPSPRG News - Steering Committee Formed

At the 1979 Raleigh Symposium a Steering Committee was nominated. Some nominees were unable to serve causing considerable delay in finalizing the composition of the Committee. The Committee is constituted as follows:

C. Parker - Weed Research Organization (Chairman)  
J. L. Riopel - University of Virginia  
A. R. Saghir - American University of Beirut  
F. Hawksworth - U.S. Forest Service  
J. Kuijt - University of Lethbridge  
S. ter Borg - University of Groningen  
J. Dawson - U.S. Dept. of Agriculture  
M. Calder - University of Melbourne  
L. J. Musselman - Old Dominion University (Secretary)

This Committee will function as a co-ordinating committee for future symposia, exchange of information and ideas and communication of news, notes and literature to HAUSTOKIUM.

#### Special Symposium on Haustoria

A special meeting on haustoria is planned for 1981 in Australia. The plans are not yet finalized but anyone interested may contact Prof. J. Kuijt, Biological Sciences, University of Lethbridge, Lethbridge, Alberta, Canada.

Sixth Symposium on morphology, anatomy and systematics, 9-12 March, 1981, Ulm, West Germany will include a special session on parasitic angiosperms. IPSPRG members are invited to attend. Those interested in participating should contact Prof. F. Weberling, Universität Ulm, Abteilung für Biologie v, Oberer Eselsberg, Postfach 4066, D-7900 Ulm/Donau, West Germany, by 1 November 1980.

#### Printed Supplement to the Proceedings of the Second Symposium on Parasitic Weeds Available

Due to the late arrival of manuscripts, it was necessary to produce a supplement to the print proceedings. This was made available free to all participants at the symposium. Additional late papers were received and it was suggested at the meeting that a second "final" supplement be produced. Through the efforts of Prof. A. D. Worsham a printed supplement was produced using the same cover, binding and printing process. The additional expense of this

volume could not be covered by symposium finances. The earlier supplement should not be cited and copied and will not be distributed. Copies of the final supplement may be purchased from:

Professor A. D. W rsham  
Department of Crop Science  
North Carolina State University  
Box 5155, Raleigh  
North Carolina 27650, USA

The cost of the supplement is US \$3.00 plus postage - surface foreign \$0.80, surface North America \$0.59, air foreign \$2.00. Make cheque for the supplement and postage payable to North Carolina State University.

A limited number of copies of the Proceedings are still available at the original cost of \$5.00 + \$1.25 foreign surface postage.

Conservation of Rafflesia

Prof. Meijer (Herbarium, T. H. Morgan School of Biological Sciences, Univ. of Kentucky Lexington, Kentucky, USA) is involved in an effort to preserve the natural habitat of *Rafflesia* species in Indonesia. He will welcome enquiries on this topic.

How many mistletoe families?

Historically, the mistletoes have been placed in the Loranthaceae. The family was divided into two subfamilies (Loranthoideae and Viscoideae) based on flower size and several embryological features. Recently, there has been a strong tendency to accept the elevation of the two subfamilies to family status: The Loranthaceae, s.s., and the Viscaceae.

LORANTHACEAE. This widespread family, mainly of southern origin, includes some 700 species in about 70 genera. Several hundred species, originally described under "*Loranthus*" have now been assigned to other genera. Now only 1 species is retained in *Loranthus* (i.e. *L. europaeus* of Europe and Asia). Some of the most widespread genera are *Tapinanthus* in Africa, *Dendrophthoe* in S.E. Asia, *Amyema* in Australia, and *Psittacanthus* and *Struthanthus* from Mexico to South America.

VISCACEAE. This family is primarily northern and contains about 400 species in 7 genera. It includes the well-known Old World genus, *Viscum*, the New World *Phoradendron* (the largest mistletoe genus with over 200 species) and *Arceuthobium* (the only mistletoe genus that occurs in both Old and New Worlds),

EREMOLEPIDACEAE. This rare South American group contains 3 genera - *Antidaphne*, *Eremolepis*, and *Eubrachion*. Its affinities are somewhat obscure as it seems to have relationships with the Santalaceae. Recently it has been generally regarded as a distinct mistletoe family,

-- G. Hawksworth.

Breeding for resistance to *Striga hermonthica* in Sorghum bicolor at Samaru, Nigeria

Significant varietal differences were observed for non-flowering *Striga*, flowering *Striga* and total number of *Striga* per hill of three sorghum plants. Three pure lines, SSV6, SSV3 and SSV2, showed resistance in that decreasing order; two single cross hybrids, SSH2 and SSH1, are also relatively resistant and tolerant respectively. These long season varieties and hybrids are adapted to the Northern Guinea savanna. Three early lines, KSV3, KSV4, KSV9, and two medium maturing varieties, KSV2 and KSV6, adapted to the Sahel and Sudan savanna respectively have been found to show resistance. The line 2123 was the most susceptible in the Northern Guinea savanna.

Correlation estimates (rp) show that number of flowering *Striga* and total *Striga* counts are significantly correlated with establishment and harvest stand counts, number of heads, head weight and dry stalk weight. The negative relationship between total *Striga* sorghum head weight and dry stalk weight indicates that total *Striga* count is important, as a good criterion for measuring resistance; the increase in total number of *Striga* leads to decrease in sorghum yield. Vice versa, the positive relationships between stand count and the *Striga* counts indicate that with an increase in sorghum plants, there is an increase in the incidence of *Striga*. However, regression estimates show that there is little or no linearity in the observed dependence of sorghum traits on *Striga* counts.

Investigations to determine the mode of inheritance of the resistance to *Striga* and the gene action conditioning resistance are in progress.

-- A. Tunde Obilaja

## LITERATURE

Visser, J. H. 1978. The biology of *Alectra vogelii* Benth., an angiospermous root parasite. Beitr. Chem. Konow. Bio-und Okosyt, 279-294. This is a review of the present state of knowledge on this interesting and sometimes damaging parasite. From information presented in this paper it is evident that much of the data on such topics as host range and autotrophic ability needs verification.

El Hiweris, S. O. 1979. Physiological studies on the relationship between *Striga hermonthica* Del. (Benth), and *Sorghum vulgare* Pers. Doctoral thesis - University of Reading, pp 328. These studies demonstrate the dramatic influence of *S. hermonthica* on the growth regulator balance within infested sorghum plants. Gibberellins and cytokinins reaching the shoot system are greatly reduced and inhibition increased - findings which explain the stunting effect on the host shoot system. The mechanism behind these changes is not explained but it is shown that the effects are similar to those caused by drought stress. Portions of this thesis were presented at the 2nd Int. Symp. on Parasitic Weeds 1979 in the paper by D. S. H. Drennan and S. O. El Hiweris, pp. 144-155.

Ozenda, P. and Capdepon, M. 1979. Recherches sur les Phanerogames Parasites. III Sur la Continuite des Appareils Parasitaires entres les Scrophulariaceae et les Orobanchaceae Bull. Soc. Bot. Fr., 126, Lett. Bot. 4, 453-460. The morphological reduction and specialization of the haustorium of the Scrophulariaceae and Orobanchaceae has long fascinated botanists. The subject of this paper is the morphology of the tuber-like organs found in some genera (e.g. *Xylanche*, *Striga*) where the tissue of the host root contributes considerable bulk to the parasitic organ.

Schmitt, V., Schlüter, K. and Boorsma, P.A. 1979. Chemical control of *Orobancha crenata* in broad beans. FAO Plant Protection Bulletin 27, (3), 88-91. Very successful results are reported from four trials on heavily infested sites in Morocco. Two applications of glyphosate controlled *O. crenata* almost completely and raised yields by 500 to 800 kg/ha. Two applications of 60 a.i. in 500 l water per ha are recommended, the first at tubercle or bud stage and the second 2 weeks later.

Bischof, F. 1978. Common weeds from Iran, Turkey, the near east and north Africa. Eschborn German Agency for technical co-operation. 223 pages. HAUSTORIUM readers will be interested in this book, lavishly illustrated in full colour with photographs of mature plants and drawings of seeds and seedlings. One species of *Cuscuta* (*C. approximata*) and four of *Orobancha* (*O. ramosa*, *O. aegyptiaca*, *O. cernua*, *O. crenata*) are included. The corollas of *O. cernua* (p. 168) are much bluer and more flared at the mouth than some strains grown at WRO.

Mushtaque, M. and Baloch, G. M. 1979. Possibilities of biological control of mistletoes, *Loranthus* spp., using oligophagous insects from Pakistan. *Entomophaga* 24 (1) 73-81. Out of 27 spp. of insects and mites, associated with *Loranthus* spp. in Pakistan, four have been found to be sufficiently damaging and host specific to be promising for further biological control studies.

Stewart, G. R. and Orebamjo, T. O. 1980. Nitrogen status and nitrate reductase activity of the parasitic angiosperm *Tapinanthus bangwiensis* (Engl. and K. Krauss) Danser growing on different hosts. *Ann. Bot.* 45, 587-589. This mistletoe has the capacity to synthesize and reduce nitrate ion. It is able to assimilate nitrate nitrogen into glutamine or glutamate. The nitrogen status of the parasite was very similar to that of its host plant.

Pieterse, A. H. and Daams, J. 1979. Parasitaire Onkruiden. *Natur en Techniek* 47 (12), 704-721 (in Dutch). This is a treatment of parasitic angiosperms, especially parasitic weeds, for the layman. The paper is beautifully illustrated with full colour pictures.

Fisyunov, A. V. 1977. (Parasitic weeds and their control). *Sornyakiparasy i bor's nimi*. Moscow, USSR. Rossel'khozizdat. 72 pp (in Russian). Detailed description of *Cuscuta Orobanche* and native hemiparasites are given. *Striga* species, although not occurring in the USSR, are described and a quarantine advocated to keep them out.

HAUSTORIUM is edited by Chris Parker and Lytton Musselman and produced and mailed by Old Dominion University. Any news, notes, research in progress, literature or other items dealing with parasitic angiosperms is welcomed. Such material as well as requests for future copies of all newsletters (supplies of all earlier issues are exhausted) may be sent to:

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New biological control newsletter

The Commonwealth Agricultural Bureaux (CAB) have just released a sample issue of new "Biocontrol News and Information". This contains several pages of news items on biological control and some 500 relevant abstracts selected from their various abstract journals. This issue will also contain a review article and the topic of this first issue is by chance "Potential for biological control in the suppression of parasitic weeds" by D. J. Girling, J. Greathead, A. I. Mohyuddin and T. Sankaran all of Commonwealth Institute of Biological Control (CIBC). This gives an excellent overview of the present possibilities and prospects for biological control of all four main groups of parasitic weeds - Striga, Orobanche, Cuscuta and mistletoes,

The sample is free, and the journal will appear quarterly from March 1980 priced £4.00 in the first year. Further information can be obtained from D. J. Girling, CIBC, Information Service, 56 Green's Gate, London SW7 5JR, UK.

C. Parker

Annotated bibliographies on parasitic weeds

Four new bibliographies are now available in the WRO series. These consist of sets of abstracts mainly reproduced from CAB "Weed Abstracts". They are:-

No 133 on Orobanchaceae (91 abstracts, 1977-79). Price £4.00 in UK, 4.80 overseas

No 134 on Scrophulariaceae (including Striga) and Santalales (59 abstracts, 1977-79). Price 3.50 in UK, 4.20 overseas.

No 135 on Cuscuta species (69 abstracts, 1976-79). Price £3.50 in UK, 4.20 overseas

No 136 on mistletoes (111 abstracts, 1974-79). Price £4.00 in UK 4.80 overseas.

Please send remittance made payable to ARC Weed Research Organization with your order. For those in **developing** countries who would *have* difficulty in sending payment please address requests direct to me at, Weed Research Organization, Yarnton, Oxford OX5 1PF, UK. Lists of earlier bibliographies in the series are also available.

C. Parker

IPSPRG News and Notes

Symposium proceedings - Copies are still available from Prof. A. D. Worsham, Crop Science Dept., Box 5155, N.C. Univ., Raleigh, N.C. 27607. Cost is \$8.00 for the proceedings and supplement.

Symposium group picture - contact L. Musselman for details as to cost, etc.

Six Symposium on Morphology, Systematics, Univ. Ulm 9-12 March 1981 - Parasitic flowering plants will be the theme of the meeting. For information contact: Dr. H. C. Weber, Blo. V. Univ. Ulm, D-7900 Ulm, West Germany.

Index of Current Research - Response to this program (see HAUSTORIUM No. 3) has been encouraging and we can now provide names, addresses, publications, etc. of participants.

request. Contact L. Musselman.

Previous issues of HAUSTORIUM - these are all exhausted,

From the Editors

Very best wishes for the mistletoe season and for the coming year!

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