HAUSTORIUM

Parasitic Plants Newsletter

Official Organ of the International Parasitic Seed Plant Research Group

October 1989 ..... Numb

■ HAUSTORIUM FUNDING

We are very pleased to announce that USAID has funded HAUSTORIUM for the coining year with notification of intent to fund it for another two years. .This is the first time that our newsletter has received direct funding. In addition. funds are available for a *Striga* information retrieval system. This will be a collaborative effort among several organizations involved in *Striga* research

■ FIFTH INTERNATIONAL SYMPOSIUM OX PARASITIC WEEDS

IPSPRG has recentlv been invited to consider Nairobi, Kenya as the venue for the next International Svmposiuin on Parasitic .Weeds in June 1991. Negotiations are underway and we hope to have the first formal announcement in the January 1990 issue of HAUSTORIUM. Please send your comments about the venue of the next symposium to either editior.

■ SEMI-ARID TROPICAL CROPS I SFORMATION SERVICE (SATCRIS)

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) announces an information retrieval system dealing with the five mandated crops of ICRISAT: sorghum. pearl millet. chickpea. pigeonpea. and groundnut. Topics would certainlr include parasitic ueeds. Interested persons should contact: SATCRIS. ICRISAT. Patancheru. Andhra Pradesh 502 324. India.

■ INTERNATIONAL OROBANCHE WORKSHOP, OBERMARCHTAL, AUGUST 1989

Sixtv Orobanche workers gathered in the beautiful surroundings of the old monastery at Obermachtal to hear and discuss 40 presented papers and 15 posters. Some 16 countries were represented. including for the first time at such a meeting USSR. Bulgaria. Ethiopia and Nepal. The main conclusions to he drawn from the meeting included the following:

Taxonomy/parasite variation. There was further discussion. hut still no clear conclusion on. the relationship/status of taxa in the O. *cernua/O.cumana* (Tervokhin) and 0. *ramosa/* O. *aegyptiaca* complexes (Musselman); while an unfamiliar name. *O. solmsii*. was introduced by Bharati to describe an important species in Nepal. apparently close to *O. cernua*. The allozyme/iso-enzyme technique had been used by Verkleij to confirm that the outcrossing O. *crenata* shows much greater variation within populations than between them. It was suggested that corresponding work with this or other techniques was needed on the above species complexes and on host specie., variety-specific biotypes. in parallel with further simple host-range studies. so that the potential importance of local population.; of parasite can he determined more quickly and positively.

Ecology. Jones described how the pollination of most British populations of *Orobanche* is autogamous; hut in discussion it transpired that cross-pollination of some of the same species mav occur bv insects where they are

not so near their northern limit of distribution. Teryokhin emphasized the perennial nature of many *Orobanche* species. A number of papers described results or techniques which contribute to population dynamics studies. Total seed production over 200.000 per plant was reported for both *O.* crenata (Garcia Torres) and O. *cernua* (Agrawal). In Syria. Sauerborn had developed a method for sampling soil for buried seed and looked at alternative sampling patterns for optimum precision of the estimate. On the same theme. Linke studied the longevity of seed of O. crenata and loss assessment was considered by Zaitoun. Distribution by wind was shown to be important in *O. cernua*. resulting in contamination of sunflower seed heads and hence long-distance transfer of infestations across Spain (Garcia Torres).

Physiology/biochemistry. A number of papers on seed conditioning and germination reported progress in the design of artificial stimulants (Zwannenburg), understanding the role of gibherellins (Joel, Al Ghamwary) and the direct effect of nitrogen compounds (Pieterse). A study on the sugar balance in *O.* crenata showed the importance of mannitol in the parasite (Harloff). Effects of glyphosate on amino acids in faba bean and *O.* crenata were reported bv El-Masry. The possible effects of vesicular-arbuscular m-corrliiza were explored by Klein. Khalaf described continued efforts at the characterization of the O. crenata stimulants from faba bean.

Resistance hreeding. No substantial progress was reported but there had been some clarification of the nature of the resistance of 'Giza 402' (ter Borg) and its incorporation into improved faba bean cultivars (Cubero), while Daruish claimed some progress in the selection of tolerant varieties in Egypt. The study bv ter Borg was of interest in terms of the detailed technique for observation and quantification of root growth. A final paper by Wegmann suggested the involvement of phytoalexins in resistance. and the possibilities for genetic engineering to introduce appropriate genes into breeding material.

Control. In Egypt proinising results had been obtained on *O. crenata* with rotation into Egyptian clover and other break crops (Al Menoufi). The value of delaying planting date of faba beans had been further confirmed and explained in terms of soil temperature effects on germination (van Hezewick). The practical usefulness of 'solarization' had been extended by Abu-Irmaileh's report of successful use of black plastic which could be left down and transplants planted through it. The usefulness of glyphosate has not quire lived up to expectations, with some disappointing results in faba bean and lack of adequate selectivity in carrot (Jacobsohn) and tobacco (Nemli). One useful tracer study by Muller and Dieter suggested that poor control of O. crenata may be associated with heavy infestations. Fortunately some new herbicides (e.g. imazepyr. imezathepyr. chlorsulfuron) are showing promise for use against *Orobanche* in legume crops and sunflower (Garcia Torres, Linke): and undisclosed chemicals understood to be iso-cvanates were reported to be proving successful as germination stimulants in field trials in Bulgaria (Tchalakov). "Telone" (1,3-dichloropropane) had shown some promise as a fumigant in Israel, but not consistently (Jacobsohn). Other chemicals were also proving of interest in at least reducing the damage to crop. if not controlling the parasite. e.g. asorbic arid (Bhargava) and cycocel and gibberellins (Kheir). And at a very simple level. wiping newly-emerged plants with vegetable oils had proved successful in India (Krishna Murty).

There were also several papers on *Striga hermonthica* - on carbon fluxes (Press Graves), stomatal behavior (Smith). and changes in protein during conditioning and germination (Logan and Wylde). There were also three papers on the development of cowpea varieties resistant to S. *gesnerioides* (Hussain. Gworgwor. Lane).

Prof. Wegmann is to be thanked for arranging a successful meeting in delightful surroundings. and the sponsors GTZ. Baver and BASF for providing financial assistance to many of the participants.

Preparation of a published proceedings incorporating the majority of the papers presented at the symposium is underway. The estimated date of publication is early 1989.

Further details in the January issue of HAUSTORIUM.

■ *CYCNIUM* ON SUGARCANE IN SOMALIA

Minor infestations of this annual root parasite of the Scrophulariaceae were observed on young sugarcane ratoon shoots of different cane varieties at the Juba Sugar Project. There are also a wide range of secondary hosts including ***Digitaria*** spp. ***Cycnium tubulosum*** is common in marine soils in the Juba region of central Somalia. The large, showy white flowers open at night and have no obvious fragrance. Seeds can remain viable for up to the seventh ratoon. The parasite is seldom noticed before it flowers. By the time flowers appear, severe damage to the host has occured.

A. Yusef, Juba Sugar Project

• HOSTS OF *STRZGA GESNERIOIDES* IN BOTSWANA

In our paper "Morphology and hosts of three *Striga* species in Botswana" (Bulletin Museum Nationale Histoire Naturelle. Paris. Fourth series. 9. Adansonia: 195-215). four morphotypes of ***Striga gesnerioides*** were described. These were differentiated by distinct combinations of stem morphology. internode length. and flower color. In that paper only the genus of each host was given. Identification of field specimens was subsequently provided by F. N. Hepper of the Kew Hebarium. The morphotypes are listed below in the order of the original paper.

A. short internodes. succulent stems. with yellow flowers. Host: *Ipomoea bolusiana* Schinz.

B. Short internodes. succulent items. with light-pink to deep-purple flowers. Host: ***Indigofera schimperi*** Jaub. & Spach. and ***Pteridiscus*** sp.

C. Medium internodes. non-succulent stems. with small light-pink flowers. lower lobes 2-3.5 mm long. Host: *Indigofera costata* Guill. & Perr. ssp *theuschii* (O. Hoffm.) Gillett.

D. Long internodes. non-succulent stems. occasionally red pigmented. large light-pink flowers. lower lobes 5-8 mm long. Hosts ***Ipomoea magnusiana*** Schinz; ***Rhynchosia*** cf *subulata* Schum. & Thonn.; *Tephrosia purpurea* (L.) Prrr. ssp. *leptostachya* (DC.) Brummitt.

D. M. Ralston, C. R. Riches, and L. J. Musselman

■ JOINT FAO/OAU REGIONAL WORKSHOP ON *STRZGA* CONTROL

This workshop was jointly organized by the FAO and OAU and held in Banjul. The Gambia in December 1988. Some of the recommendations include an increased *Striga* program in other countries. a re-evaluatioii of the use of paraquat and a search for an herbicide to replace it, better control of the spread of the parasite. increased collaboration among national programs by forming a network. and a recommendation that the next meeting of that network he held in conjunction with the Fifth International Symposium on Parasitic Weeds (see announcement earlier in this issue).

• PARASITIC FLOWERING PLANTS OF SOUTH AFRICA STILL AVAILABLE

Copies of this lavishly illustrated volume published in 1981 are once again available. To obtain a copy. send payment of ten US dollars to: Professor Johann H. Visser. Department of Botany. University of Stellenbosch. 7600 Stellenbosch. South Africa or ***you*** may order through the editors.

■ LITERATURE

Abu-Irmaileh. B. E. and J. E. Fucik. 1989. Using glyphosate to control eastern dodder on citrus in Jordan 24: 311-312. (*Cuscuta monogyna*

is a thick stemmmed, high climbing dodder which can kill mature citrus trees. Glyph-sate provided excellent control).

Butler. L. G. 1989. ***Striga***: Scourge of African cereals. International Sorghum and Millet Collaborative Research Support Program. University of Sebraska: INTSORMIL Publication Number 89:1. (A full color booklet detailing the life history of witchweed and recent biochemical research. This booklet will be useful in training courses).

Carson. A. G. 1989. Effect of inter-cropping sorghum and groundnuts on density of ***Striga hermonthica*** in The Gambia. Tropical Pest Management 35: 130-132. (Different patterns of sorghum and intercropped groundnut resulted in decreased ***Striga,*** perhaps due to reduced soil temperature. but also decreased sorghum yield).

Dembele, B. 1988. Aspects biologiques et agronomiques de deux Scrophulariacees parasites tropicales: ***Striga hermonthica*** (Del.) Benth. et ***Striga gesnerioides*** (Willd.) Vatke. These Doctoeur-Ingenieur. Ecole Nationale Superieure Agronomique de Montpellier.

Graves, J. D., M. C. Press and G. R. Stewart 1989. A carbon balance model of the sorghum-*Striga* ***hermonthica*** host-parasite association. Plant. Cell and Environment 12:101-107. ***(Striga hermonthica*** depends on the host for one third of its carbohydrate even after emergence. but 80% of the damage to the host is by it5 'effects on host photosynthesis).

el-Hadder. E. 1988. First record of the parasitic plant ***Cuscuta australis*** in Tunisia. *in* Near East Working Group for Improved Weed Management Newsletter 5:2. ed. P. G. Americanos. (Identification of dodders is often difficult and it could be that this report deals with ***Cuscuta pentagona.*** syn ***C. campestris.*** which closely resembles the related C. ***australis).***

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Kobayashi, H.. **H.** Oguchi. N. Takizawa. T. Miyase. A. Ueno. K. Usmanghani. and M. Ahmad. 1987. New henylethanoid glycosides from ***Cistanche tubulosa.*** Chem. Pharm. Bull. (full title?) 33: 3309-3314.

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Musselman. L. J.. and J. H. Visser. 1989. Taxonomy and natural history of ***Hydnora*** (Hydnoraceae). Aliso 12(2): 317-326.

Musselman. L. J.. M. Aggour. and H. Abu-Sbaieh. 1989. Parasitic weed problems in the West Bank and Gaza Strip. Tropical Pest Management 35(1): 30-33.

Netzly. D. H.. J. L. Riopel. G. Ejeta and L. G. Butler. 1988. Germination stimulants of witchweed ***(Striga asiatica)*** from hydrophobic root exudate of sorghum (Sorghum *bicolor)* Weed Science 36: 441-446. (Sorgoleones inhibit grou tli of lettuce and ***Amaranthus*** and may have a role as allelopathic agents. as well as stimulating Strip).

Sorris. F. G.. ed. 1988. A Christmas flower from Namaqualand. Vygie 6: 1-2. Supplement of Veld and Flora published bv the Botanical Society of South Africa. [Two parasites are

illustrated in full color; a mistletoe. *Tapinanthus oleifolius* (Loranthaceae) and *Hyobanche sanguinea*) (Scrophulariaceae)].

Polhill, R. M, editor. 1989. The Golden Bough. A newsletter to foster biosystematics of Loranthaceae and Viscaceae. (The most recent issue. number 11, is of especial value in listing all the genera of mistletoes. Copies may be obtained, free of charge, by writing the editor at: Herbarium. Royal Botanic Gardens? Kew. Richmond, Surrey TW9 3AE England).

Press. M. C., J. J. Nour, F. F. Bebawi and G. R. Stewart. 1989. Antitranspirant-induced heat stress in the parasitic plant *Striga hermonthica* - a novel method of control. Journal of Experimental Botanv **40:** 585-591. [Preventing transpiration of *Striga* by spraying di-1-p-menthene (Tilt Pruf S 600') results in kill of the weed through heat stress, and increased yield of sorghum].

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Vasudeva Rao. M. J.. V. L. Chidley. and L. R. House. 1989. Estimates of grain yield losses caused in Sorghum [*Sorghum bicolor* (L.) Moench.] by *Striga asiatica* (L.) Kuntze obtained using the regression approach. Agriculture. Ecosystem. and Environment *25*: 139-149. (Funding agencies invariably ask the question "How much damage does *Striga* do?"-- which is usually impossible to answer. This paper provides hard data on yield loss in sorghum. Predictions of loss range from 9.2 to 98%. Assuming only 10% of the hybrid sorghum crop in India is infested at levels realized in their work. the authors predict that the sorghum loss in India is about 53. 000 tons each year at a value of US$4.9 million).

Visser, J. H. 1989. *Hydnora triceps.* The Flowering Plants of Africa. 50 part 2. (This unusual plant was last collected by Dinter in 1888. One century later. the author collected it in western Namaqualand in the northern Cape Province. Perhaps its infrequent citing is due to the fact that it often flowers underground with insects entering through soil fissures. A beautiful watercolor accompanies this paper).

Visser, J. H. and B. Beck. 1989. The resistance of guar ***Cyamopsis tetragonoloba*** (L.) Taub. to attack by the root parasitic ***Alectra vogelii*** (Benth.). S.-Afr. Tvdslcr. Plant Ground 6: 124-128. (full title?) (Most varieties of guar stimulate germination of A. ***vogelii*** but often cause stunted growth of the radicle making guar a suitable trap crop.

■ SABIR BARSOUM SAFA

We regret to inform HAUSTORIUM readers of the death of Dr. Safa on 1 October 1989. just nine days before his fortieth birthday. Dr. Safa received his PhD in botany from Royal Holloway College (University of London) working on the floral biology of ***Striga hermonthica.*** He was on the faculty of Gezira University. Wad Medani. Sudan and took a leave of absence to join the Parasitic Plant Laboratory at Old Dominion University in 1987 where he continued his work on floral biology. especially of S. *aspera* in West Africa. until the time of his illness.

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