



# HAUSTORIUM PARASITIC PLANTS NEWSLETTER OLD DOMINION UNIVERSITY

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## STRIGA GESNERIOIDES IN THE NEW WORLD

On 12 October 1978 M Allen G Schuey collected S. gesnerioides as part of an environmental field survey of an old phosphate mine in central Florida. Believing this to be an **unusual** plant that he had not previously encountered, Schuey took the plant to Dr Richard P Wunderlin, Curator of the Herbarium at the University of Florida in Tampa, who later identified it as S. gesnerioides. It was flowering at the time of collection which would be the approximate time of flowering in West Africa.

This Striga is widespread in Africa but also **grows** in Arabia and India. Unlike most Strigas, it **lacks** expanded green leaves at maturity. It also differs from other pathogenic members of the genus by attacking mainly broad-leaved plants. Documented hosts include peanuts (Arachis hypogea), cowpeas (Vigna unguiculata), tobacco (Nicotiana spp.) and numerous other species of Leguminosae, Convolvulaceae and several other families. In fact, it may have the broadest host range of any Striga. In Florida it was parasitizing Alysicarpus vaginalis and Indigofera hirsuta. Both are introduced forage legumes that have become weeds in Florida.

The Director of the USDA's Witchweed Laboratory, Dr Robert Eplee, informs us that his agency is involved in survey and research activities. They found the present area of distribution to be roughly 100 km<sup>3</sup>. A large number of crop, ornamental, and weedy species are being tested as potential hosts. Until the host range is determined, no special quarantine is to be implemented although all species of Striga are covered by the U S Federal Noxious Weeds law.

It is intriguing to consider how this parasite came to Florida. One speculative (and perhaps far-fetched) idea is that the very small seeds were carried in the dust that frequently is blown over Florida from the sub-saharan regions of Africa where this species is common.

#### ICRISAT STRIGA RESEARCH

ICRISAT (International Crops Research Institute for the Semi-Arid Tropics) have moved their main research effort on Striga from their headquarters in Hyderabad, India, to the outreach station at Ouagadougou, Upper Volta. Dr K V Ramaiah has moved to West Africa to head the new expanded project, which is supported by IDRC (International Development and Research Centre of Canada). The main topics are the selection and breeding of resistant cultivars of sorghum and Pennisetum millets and the evaluation of germination stimulants (ethylene and synthetics) and cultural practices including rotation. The project will also provide training of African scientists in Striga methodology and co-ordination of all aspects of Striga control research in Africa. The work on millet will be mainly conducted at Maradi, Niger under the supervision of Dr B B Singh.

Materials have already been sent out for varietal trials by a number of collaborators in Africa and India. The most promising cultivars are also being studied in a collaborative project at WRO (Weed Research Organization) Oxford, England, financed by ODA (Overseas Development Administration).

Dr Ramaiah's address is:-  
ICRISAT/UNDP  
B P 575  
Ouagadougou  
Upper Volta  
West Africa

#### DIVERSITY IN STRIGA ASIATICA

On 2 recent visit to Indonesia, Chris Parker of WRO was interested to be able to collect seed of two more distinct forms of S. asiatica, one a small, yellow-flowered form occurring extensively along roadsides in South Sumatra, mainly on an Eragrostis sp. The other was on Ischaemum timorense at Bogor and even smaller with a pale pink flower. A very small, white-flowered form has previously been noted in Java, on Axonopus compressus and Mr S Soerohaldoko at the 5th Indonesian Weed Science Conference in April

reported. a purple-flowered form on Imperata cylindrica at higher elevations. These are all smaller and distinct from the Indian (mainly white-flowered) and African (mainly red-flowered) forms. Their exact taxonomic status is not certain but it seems that, thanks to the characteristic self-pollination in the species a diversity of taxa has evolved which retain their distinct form and do not inter-breed. It seems very probable that each of these types has a relatively narrow host specificity but more experimental work is needed to confirm this.

#### HOST SPECIFICITY IN CUSCUTA

Cuscuta species are often found growing over a number of different host species and the host specificity of several of the more important species is certainly wide. A recent paper by O F Mamluk and H C Weltzien of University of Bonn, however, shows that, while C. planiflora from a sugar beet crop was able to attack a wide range of hosts, including cucumber and tomato, material of the same species collected from several other hosts such as aubergine (Solanum melangera) and onion could attack sugar beet but not cucumber or tomato. Is this the first report of intra-specific variation in host specificity in Cuscuta? Perhaps it is more widespread than generally considered. The paper referred to is O F Mamluk and H C Weltzien, "Verbreitung und Wirtsspektrum einiger Cuscuta - Herkünfte aus dem Vorderen und Mittleren Orient", Zeitschrift für Pflanzenkrankheiten und Pflanzenschutz 85 (2) 102-107, 1978.

#### LITERATURE

THE BROOMRAPES (OROBANCHACEAE), A REVIEW. By A H Pieterse 1979. Abstracts on Tropical Agriculture 5 (3): 9-35. This is a review of the literature on Orobanche and related genera. Over 400 papers are cited. There are brief discussions of taxonomy, distribution, haustorial development, floral biology, seed germination, hosts and the effect of parasitism and control. The authors address is 63 Mauritskade, Amsterdam-Oost, The Netherlands.

future meetings. The exact structure and functions of the group are not yet fully defined. Membership consists of those receiving HAUSTORIUM. In a way it is a successor to the European Weed Research Council Research Group on Parasitic Weeds that flourished in the early '70s but went dormant some years ago. It had served a useful purpose but could not legitimately concern itself with the most important parasitic genus of all: Striga.

The IPSPRG will have an advisory committee composed of about ten individuals representing a broad scope of organisms, approaches, and geographical distribution. Mr. Chris Parker was elected chairman of the group and Lytton Musselman secretary. Replies from **all** those asked to serve on the committee have not been received but should be in time for inclusion in the December issue of HAUSTORIUM. This newsletter will serve as the official organ of the IPSPRG.

L. Musselman

C. Parker

### IPSPRG Members Invited to Participate in the 13th International Botanical Congress

At the recent **symposium** in North Carolina I raised the matter of the 13th International Botanical Congress which will be held in Sydney, Australia from 21-28 August, 1981. Several colleagues at the Raleigh meeting indicated interest in a Congress Symposium on parasitic flowering plants, and I have discussed **this** possibility with the organizers, who would be happy to have such a topic included in one of the sections, possibly **Developmental Botany**. I have given some thought to a suitable theme, and several possibilities seem worthy of further consideration. For the three I have suggested I have provided a title and a brief explanation of content, and I would be very interested to have your comments and any alternative suggestions you may wish to make.

Topic 1: Parasitic Seed Plants--the Haustorium

To include a general paper on the structure and function of the haustorium, followed by specific papers (invited or contributed).

Topic 2: Parasitic Seed Plants--Floral Biology and Reproduction

To include a general paper on the reproductive strategies of parasitic plants, followed by specific papers covering research into the floral biology and seed production of the various families which have been investigated.

Topic 3: Parasitic Seed Plants--the Life Style

To include a general paper on the nature and evolution of the parasitic way of life in seed plants, **followed** by specific research papers on assimilate translocation and water relations, including information on fine structure and physiology of the host/parasite interface as well as these aspects of the parasite alone.

No doubt there are other themes which could be suggested, but the foregoing are sufficient to give some idea of what might be done. I should very much welcome suggestions on these ideas or any other comments you would care to make. I am particularly anxious to **hear** from colleagues who may wish to provide a contributed paper. If you are interested please contact me at: School of Botany, University of Melbourne, Parkville, Victoria 3052, Australia.

Malcolm Calder

### Samaru Striga Research

The Institute for Agricultural Research at Samaru in Northern Nigeria has a comprehensive integrated program of research on Striga hermonthica, S. gesneroides and a few other related root parasites.

The world collection of maize and sorghum cultivars which are stored at the station have been screened for field resistance by the Plant Pathology and Plant Breeding departments while the screening of cowpeas is still in progress. Useful genetic resistance has been identified in a range of sorghum and cowpea varieties which are already agronomically adapted for immediate use in the savanna environment.

Agronomic studies by the Weed Science Section have developed herbicidal and cultural control techniques which can be used by African subsistence farmers. From 1977-9 the section has been field testing the "strigol analogs" synthesized by Sussex University.

The conclusive results of these studies (breeding for resistance and cultural control) now make it possible to produce simple "integrated control" packages combining resistant or tolerant cultivars with the appropriate agronomic measures. The very exciting levels of activity and persistence discovered in the strigol analogs against S. hermonthica promise a substantial reduction in the economic damage caused by this species in cereal crops in the near future.

J. E. A. Ogborn .

### Index of Parasitic Seed Plant Research

One of the topics mentioned at the **IPSPRG** organizational meeting in Raleigh was the production of an index of workers and their research specialties. The green form attached to this issue is for that purpose. Please fill it out completely and return to the address on the form as soon as possible. From this a computerized file will be prepared for distribution to all who request it. This file will also allow for the search of specific topics, e.g., species of parasites, host plants, control, etc., that can be easily retrieved upon request.

L. Musselman

### Alectra: A Pest in Botswana

Our work here involves testing animal drawn tillage systems under subsistence farming conditions aiming to increase crop production over that achieved by traditional methods of broadcasting and ploughing under crop seed mixtures. Farmers participating in the project grow sorghum, maize, sunflower and cowpeas. While patches of Striga asiatica are found in many sorghum crops, it is Alectra vogelii, called here cowpea witchweed, which is proving to be a major problem. Total crop failure caused by this parasite has occurred in a number of cowpea fields where a good plant stand had been established.

C. R. Riches

### A New Striga Problem in Ethiopia

Striga latericea Vatke has recently been implicated as a serious pest in some taro cane plantings near Addis Ababa. It is a robust striga and has pinkish-orange corollas. This is apparently the first time it has been reported to damage a crop.

T. Feredegn

Literature

Russell, G. E. Plant breeding for pest and disease resistance. Buttersworth, London. 495pp. This **volume** contains a separate chapter (Chapter 12) on parasitic weeds dealing largely with Cuscuta, Orobanche, and Striga. The author presents a succinct **review** of the literature and points to the need of understanding genetic variation in parasitic weeds.

L. Musselman

Requests for Previous Issues

Sorry, our supply of both prior **issues** is exhausted!

Material for HAUSTORIUM is to be sent to either of the editors. Readers are urged to submit any items that may **be** of interest.

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