haustorium

Parasitic Plants Newsletter

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DECEMBER 1984

Official Organ of the International Parasitic Seed Plant Research Group

INDEX OF PARASITIC SEED PLANT WORKERS

Enclosed with this issue of HAUSTORIUM is a form to be completed by anyone interested in being included in a directory of international workers in parasitic seed plant research. The need for such a directory was discussed at the 1984 IPSPRG symposium in Aleppo. The intent is to provide in a single source a listing of workers, their specialties, and parasites on which they are working. This would allow funding agencies to identify workers and projects as well as provide for lack of duplication of effort by workers. Information will be computerized and arranged by taxonomic group, area of research, as well as individual name and country. Please complete the form as thoroughly as possible and return it to the address on the form. Add any other information you consider pertinent as we want the directory to be as exhaustive as possible. The plan is for IPSPRG to publish the directory, distribute to all IPSPRG members and sell remaining copies. All this depends, of course, on available funds.

SYMPOSIUM ON THE BIOLOGY OF DWARF MISTLETOE

A symposium on the biology of dwarf mistletoes (Arceuthobium) was held at Colorado State University, Fort Collins, Colorado, on August 8, 1984 in conjunction with the national meetings of the American Institute of Biological Sciences. It was, no doubt, the largest concentration of Archeuthobiologists ever assembled. The symposium was organized by F.G. Hawksworth and R.F. Scharpf of the united states Department of Agriculture Forest Service.

Proceedings from the symposium will be available soon and can be obtained without cost by writing: F.G. Hawksworth, 240 West Prospect, Fort Collins, Colorado 80526 USA. Fifteen papers were presented under four broad topics:

* BIOSYSTEMATICS, HOSTS, AND DISTRIBUTION. Hawksworth and Wiens updated recent taxonomic developments in the genus and summarized nine new taxa described since the appearance of their 1972 monograph. Kiu Hua-sing reviewed Arceuthobium in China, including the two new species he described recently. The first isozyme study of the dwarf mistletoes was described by Nickrent, Guzmann, and Eshbaugh. Linhart discussed isozyme variation of two dwarf mistletoes in relation to their host species.

* PHYSIOLOGY, ANATOMY, RESISTANCE. Alosi and Calvin described light and SEM studies of the morphology of the endophytic system. Hormone relationships of mistletoes and hosts were discussed by Livingston, Bremer, and Blanchette. A study of water relations and seedling photosynthesis was described by Tocher, Gustafson, and Knutson. Scharpf discussed host resistance to the dwarf mistletoes.

* POPULATION DYNAMICS. 'Seed development, germination, and infection characteristics of Arceuthobium were described by Knutson. Gilbert and Punter discussed pollination biology of a dwarf mistletoe in Manitoba, *Canada.* Stevens and Hawksworth summarized literature on insect and mite associates of dwarf mistletoes. The possibility of long-distance dispersal

by birds and mammals is described by Nicholls, Hawksworth, and Merrill.

* ECOLOGY. Relationships between dwarf mistletoes and understory vegetation (habitat types) are reviewed by Mathiasen and Blake. Tinnin outlined the changes in community structure and function resulting fran dwarf mistletoe infestion, The complex inter-relationships between dwarf mistletoes and fire *are* discussed *by* Zimmerman and Laven.

NEW PARASITIC WEED RECORDS AND CONCERNS

On a recent visit to Mali, Chris Parker found a serious infestation of Alectra vogelli attacking cowpea in the vicinity of Bamako. It was noticed some years ago, but had previously been misidentified as Vahlia digyna. The Flora of West Tropical Africa (FWTA) records this only fran Nigeria, Ghana, and Guinea. A recent *search* in the Paris herbarium has turned up a single specimen dated 1964 from a different part of Mali, but this site has not been re-checked. Cuscuta campestris was also found near the old airport at Bamako. The FWTA records this potentially dangerous species from only a single site in Cameroun. It was also collected by Parker in Northern Nigeria but is still a rarity in West Africa. A recent introduction into Sudan was reported in a previous issue of HAUSTORIUM. John Terry (Weed Research Organization) collected Striga latericea on sugarcane in Sanalia at the Juba Sugar Project, This species, apparently closely allied with S. forbesii, has only once before been reported as an economic problem.

In *the* United States, there is concern over the introduction of Cuscuta chinensis which has been reported to be a serious problem on soybean in other parts of the world. According to Jean Dawson, U.S. Dept. of Agriculture, niger seed (Guizotia abyssinica) imported into the country is contaminated with the Cuscuta. Efforts are being made to determine if it is indeed this species. Orobanche ramosa was recently found to be still extant in the burley tobacco region of Kentucky, but it is restricted to seed tobacco only an present does not pose a threat to tobacco production in the region because of the practice of farmers treating seedplots with methyl bra

Not a new record, but one previously overlooked *by* weed specialists, is the presence of an established colony of Orobanche cre in Britain, well outside its main peri-Mediterranean distribution. F recorded in Essex in 1950, it has persisted there on Vicia tetraspere as it has so far only occasionally *occurred* on ~~Vica faba~~ in gardens, i still regarded as a curiosity to be protected rather than a pest to be eradicated. A report on *this* in Watsonia 15: 161-175 (1984) also n that O. crenata is "firmly establish in several botanic *gardens* in Sweder The origin of the British populatior still not explained.

PROCEEDINGS OF THE DAKAR WORKSHOP NOW AVAILABLE

The proceeding of the Dakar workshop, titl "Striga-Biolog and Control" has now been published the International Council of Scienti Unions (ICSU) Press and will be available either from IRL Press Ltd. P.O. Box 1, Eynsham, Oxford OX8 1JJ, for 20 pounds sterling + one pound fc surface postage or fran IRL Press, Inc., Suite 907, 1911 Jefferson Davis Hwy., Arlington, VA 22202 USA for $3($2 postage. Airmail is extra from either source. This 216 page, paperbound volume is the best source for up-to-date information on the Striga problan and research. ICSU is to be complimented on its rapid and attractive production.

LITERATURE

Bernhardt, P. 1984. Mistletoes on mistletoes: The floral ecology of Amyema miraculosum and its host, Amyer miquelii (Loranthaceae). Australian Journal of Botany 32:73-86. (This is

study of the floral biology of two mistletoes which are in competition for the same pollinators, in this case birds. The host mistletoe, T. miquelii, received more visits than its parasite. Although 22% of all pollinator visits were interspecific, no hybridization occurred.)

Musselman, L.J. 1984. Tracking the elusive tartous of the Blue Nile. Explorer 26:8-11. (An illustrated popular account of the biology of Hydnora johannis (=H. abyssinica) in Sudan).

Worth, C.R., J.L. Riopel, and N.W. Gillespie. 1984. Genetic uniformity in an introduced population of witchweed (Striga asiatica) in the United States. Weed Science 32:645-648. (This study confirms the long held suspicion that the autogamous American strain of this parasite is genetically uniform and suggests that the population was introduced by only a few *seeds*).

[illegible], P.F., R.E. Eplee, C.E. Harris, and R.S. Norris. 1984. Longevity of witchweed (Striga asiatica) seed. Weed Science 32:494-497. (Seed remained viable on the shelf for six *years;* seed buried deep in the soil for 14 *years* had high germination. No germination occurred after burial for 14 years. This study helps refine our estimates on the longevity of Striga seed in the

[illegible] L. Riopel. 1984. [illegible] studies of haustorium [illegible] early development in [illegible] purpurea (L.) Raf. [illegible] Orobanchaceae). American Journal of Botany 71:803-814. (This is another contribution from the laboratory of Riopel who has been applying experimental techniques to the study of haustoria. This study uses laboratory culture under defined conditions as well as scanning electron microscopy. The precise location of haustorial initiation and the very earliest stages in development are pinpointed).

[illegible]d, W.V. and J.L. Riopel. 1983. Experimental studies of the attachment of the parasitic angiosperm Agalinis purpurea to a host. Protoplasma 118:206-218. (See review above. This paper describes the early stages in attachment of the parasite to the host. The distinctive root hairs play a prominent role in "cementing" themselves to the hosts. The surface of the hairs is described. A "competency" time extends to 72 hour after which the haustorium will not attach. This work has significant implications for new methods of control in root parasites).

Bebawi, F.F., R.E. Eplee, and R.S. Norris 1984. Effects of seed size and weight on witchweed (Striga asiatica) seed germination, emergence, and host-parasitization, Weed Science 32:202-205. (Not surprisingly, seeds which were heaviest and largest gave the highest germination and were the most successful in parasitizing their host, Work such as this raises the question of what factors are involved in the development of seeds. Are firm formed *seeds* the largest?).

Mesa-Garcia, J., de Haro, A. and Garcia-Torres, L. 1984. Phytotoxicity and yield response of broad bean (Vicia faba) to glyphosate. Weed Science 32:445-450. (A useful study of the response of faba bean to glyphosate application (in the absence of Orobanche crenata) confirming *that* repeated applications at 60 *g* ai/ha are safe but 120 g/ha may cause some damage).

Nagar, R., Singh, M., and Sanwal, G.G. 1984. Cell wall degrading enzymes in Cuscuta reflexa and its hosts. Journal of Experimental Botany 35:1104-1112. (Enzymes associated with the haustorial penetration of host tissue included pectin esterase, polygalacturonase, xylanase, and exo-1, 4-beta-D-glucosidase).

Maiti, R.K., Ramaiah, K.V., Bisen, S.S., and Chidley, V.L. 1984. A comparative study of the haustorial development of Striga asiatica (L.) Kuntze on sorghum cultivars. Annals of Botany 54:445-457. (Studies of endodermis and pericycle thickening in roots of susceptible and resistant sorghum varieties are strongly suggestive of a

mechanical type of resistance in several varieties. There is also an indication of a lignification response to haustorial invasion in the pericycle of varieties N13 and IS4202.

Ghosh, S.K., Balasundaran, M., Mohamed Ali, M. 1984. Studies on the host-parasite relationship of phanerogamic parasites on teak and their possible control. Research Report, Kerala Forest Research Institute no. 21. 39 pp. (A comprehensive description of the problem of Dendropthoe falcata, its biology, and losses caused. *Also* a more detailed account of the pranising herbicide injection technique noted in HAUSTORIUM 12.

Vanderwier, J.M. and J.C. Newman. 1984. Observations of haustoria and host preference in Cordylanthus maritimus subsp. maritimus (Scrophulariaceae). Madrono 31(3):185-186. (This is a rare plant of salt marshes. Not surprisingly, it is reported that Cordylanthus maritimus subs~.maritimus will *grow* independent of host plants as well as parasitizing hosts of diverse families when *grown* in culture).

Sadler, K.C. and T.E. Hemmerly. 1984. American mistletoe (Phoradendron serotinum) in the northeastern central basin and adjacent dissected highland rim of middle Tennessee. Journal of the Tennessee Academy of Science 59(3):42-46. (Hosts for this common mistletoe are listed and factors in host selection are discussed. Notably absent is a reference to bark anatomy although bark thickness is noted).

Safo, S.B., B.M.G. Jones, L.J. Musselman 1984. Mechanisms favouring outbreedir in Striga hermonthica (Scrophulariacere). New phytologist 96:299-305.

HAUSTORIUM is edited by L.J. Musselman Dept. of Biological Sciences, Old Dominion Univ., Norfolk, VA 23508 USA, and C. Parker, Weed Research Organization, Begbroke Hill, Yarnton, Oxford OX5 1PF, UK, and typed by Ruth Carr, IPPC, OSU, Corvallis, OR 97331. Material should be sent to either editor as should requests for copies.

Copies of back issues #9, 10, 11, 12, and 13 are available free while supplies lasts. Photocopies of #1-8 are available from IPPC at US$.50 per issue.

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INDEX OF PARASITIC SEED PLANT RESEARCHERS

1. **Your name** (last, first, middle **initial**)

_____

2. Title _____

3. **Position** _____

4. ***Address*** _____

_____

_____

_____

_____

(**Be certain to include postal code, if** any)

5. **Telex** _____ 6. Cable _____

7. **Phone** _____

8. Main taxonomic groups:

8a. Family _____ **8b.** Genus _____

8c. Species _____, _____, _____

Second group:

8d. Family _____ **8e.** Genus _____

8f. **Species** _____, _____, _____

Third group:

8g. Family _____ **8h. Genus** _____

8i. **Species** _____, _____, _____

9. **Geographical area** _____

10. Type of **research effort. Be specific**, use **key** words **as taxonomy, floristics, education, biochemistry, herbicides, evolution, weed** biology, **physiology**, ecology, **etc.**

10a. First **(major) emphasis** _____ 10b. Second **emphasis** _____

10c. **Third emphasis** _____

(over, please)

11. Title of two recent (within the past five years) papers or reports (include complete citations):

11a. First paper/report _____

_____

_____

11b. Second paper/report _____

_____

_____

12. *Source* of research funding (private/government):

_____

13. Title(s) of current research endeavor(s):

13a. _____

13b. _____

Send completed form *by* 15 April 1985 to:

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