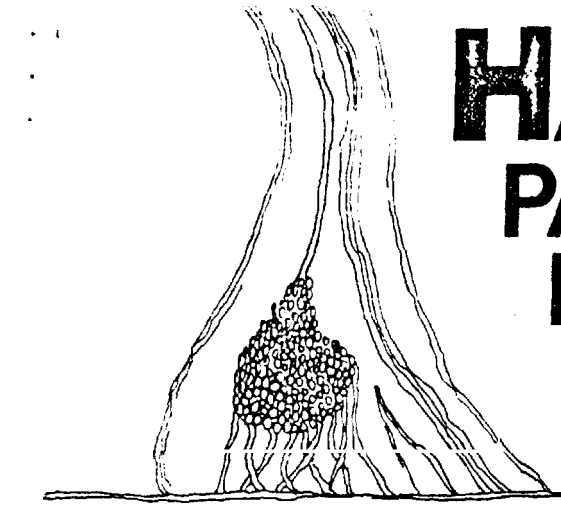


HAUSTORIUM
PARASITIC PLANTS NEWSLETTER
OLD DOMINION UNIVERSITY

Number 7. Official Organ of the International Parasitic Seed Plant Research Group. June 1981.

Cuscuta compacta on Blueberries in North Carolina

Over the past several years blueberry growers in southeastern Worth Carolina have reported an increased incidence of dodder (Cuscuta compacta) in their plantings. This is a native species which parasitizes woody or semi-woody plants. Extreme cases have resulted in loss of bushes in established plantings. The rabbiteye blueberry (Vaccinium ashei) produces basal shoots rather prolifically and is, therefore, more vulnerable to parasitism by the dodder as it offers greater probability of host attachments. Highbush blueberry (V. corymbosum) is also attacked.

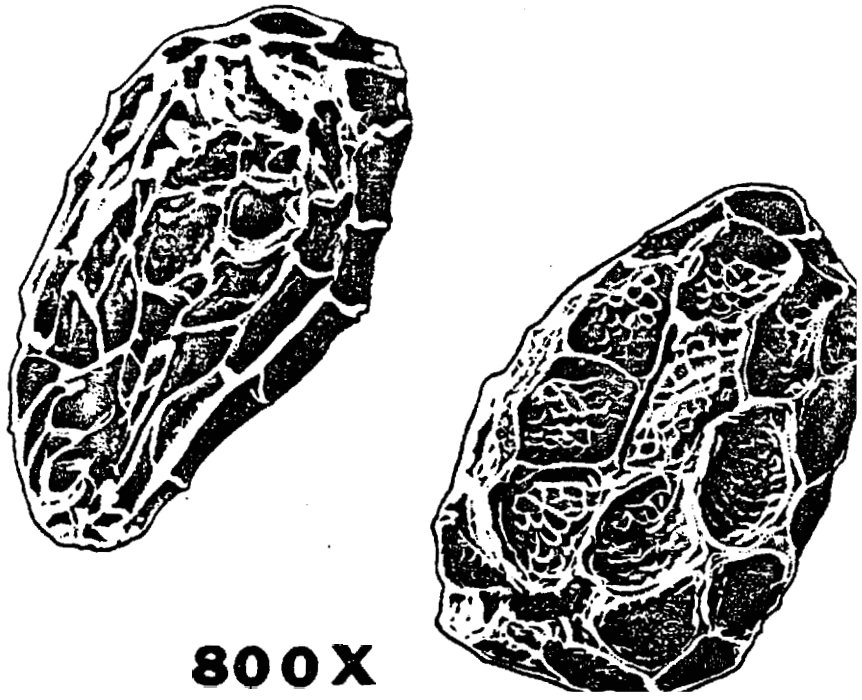
The mechanism of invasion and spread of the dodder in blueberry plantings is unknown. Dodder is observed on adjacent ditchbanks and woodland but its distribution is typically scattered throughout blueberry fields and not localized in areas adjacent to ditchbanks or woodland. This suggests dissemination by birds or other wildlife.

Dodder seed has been observed to germinate throughout the growing season; however, little germination was observed in 1980 at several sites infested in 1979. This was attributed to the extremely dry conditions which prevailed during the 1980 growing season.
T. J. Monaco and C. M. Mainland, North Carolina State University.

Orobanche cumana in China

This broomrape, some'times known as O. cernua is a parasite of sunflower and other crops and is a serious pest in several areas of China. Tt reduces sunflower yields in direct proportion to the number of parasites attached to a sunflower plant as well as to the earliness ot the attack. The minute seeds are produced in capsules which split

open when mature and may yield 1200 to 1500 seeds per capsule. A single plant may produce as many as 50000 or more seeds. Young seeds are yellow and become dark brown when ripe. They are irregular in shape but have very distinct reticulations (see drawing based on SEM photos).



Broomrape seeds may be spread long distances by surface water as the rough surface of the seed traps air and causes the seeds to float. Most of the seeds are buried in soil five to 10 cm. They may be dormant for five to 12 years while the land is planted in non-host crops and then germinate only in the close presence of a suitable host root.

Li Yang-han, Nanjing Agricultural College, Nanjing, China.

Studies on Pyrularia (Santalaceae).

The genus Pyrularia consists of two species, P. edulis, a small tree of the Himalayas, and P. pubera, the well known buffalo nut of the southern Appalachian Mts. A study on the natural history and ecological relations of P. pubera was conducted in eastern Kentucky and supplemented by studies in a controlled environment. Pyrularia pubera parasitized over sixty woody and herbaceous species including 28 families and 52 genera. Haustoria were less common on hosts grown in the controlled environment. Larger numbers of haustoria were evident in the forest depending on the host and the site. Pyrularia pubera is particularly prevalent on sites that have undergone perturbation in the form of logging, fire, windthrow and roadcuts.

D. J. Leopold, Purdue University.

rch OR Viscum album at the Laboratorium Hiscia, Switzerland

M. tletoes are not only interesting for the botanist and the pla thologist, they also represent an important material for t harmacologist. For the first tine in 1920 R. Steiner suggested ti se of V. album in cancer treatment. Today remedies extracted fr this plant are on the market in Europe and many physicans use them treating their cancer patients.

The oldest and most studied mistletoe remedy is registered under th trade name Iscador and is offered according to the host tree: apple oak, elm, fir or pine. Apple, fir, and pine mistletoes are common ar abundant in nature while native oaks and elms seldom bear V. album i Europe.

One of the main tasks of our research team is to locate and identif for protection the very rare mistletoe bearing oaks and elms alon with a study of the natural condition (birds, climate, resistance which favor or hinder the development of the mistletoe.

Another project concerns the cultivation of the mistletoe on th resistant host species. First results indicated that resistance i mainly genetically controlled and attempts are now in progress t select the most susceptible clones. This part of our research is done in cooperation with foresters who are, of course, also interested i selecting resistant clones.

The purpose of this work is to allow for chemical analysis of the mistletoe extracts and laboratory tests in order to measure their cytostatic and immunostimulant properties to improve upon non-toxic cancer therapy. The Society for Cancer Research (CH-4144, Arlesheim, Switzerland) publishes an annual report concerning our work as well as a bibliography. This report may be obtained without cost.
G. Grazi, Laboratorium Hiscia.

Parasites and epiphytes in Argentina

At the present time in Argentina there are not too many parasitic weeds in our crops, but it can be mentioned that Cuscuta indecora Choisy, C. indecora var. longisepala Yuncker and C. suaveolens Seringe. infest alfalfa (Medicago sativa) and occasionally other species such as privet (Ligustrum spp.) and Ambrosia tenuifolia. Many years ago the hemiparasitic Arjona tuberosa Cav. var. tandilensis (O.K.) Dawson (common names "mata trigo" and "Macachin del trigo") was very noxious in. wheat crops but good systems for cleaning the seeds caused elimination of this weed.

Besides Arjona there are other species of the Santalaceae which found in our country- Acanthosyris sp., Jodina sp., etc.

In the Loranthaceae there is Ligaria van Tieg. and Psittacant cuneifolius (R. et Pav.) Blume but these are of little importance agriculture.

Work is now in progress on two species of the genus Tillandsia wh live as epiphytes on many trees in the La Plata area. These pla are considered by us as true aerial weeds as they caused defoliat and finally the death of the tree. Preliminary studies suggest t the epiphytes produce an inhibitor that causes defoliation.
F K Claver, Univ Nacional de la Plata

Cuscuta in Argentina

In Argentina Cuscuta is widely distributed over almost the entire a where alfalfa is grown for seed, from the Province of Chubut to Sal It is also found in areas where alfalfa is grown for forage infestations are lighter because of the frequent mowing.

In the south of the Poia de Buenos Aires irrigated by the Color River where alfalfa has been grown for over 70 years, Cuscuta i very serious problem. In fact, alfalfa is no longer grown in s parts of this region due to the parasite.

for these reasons alfalfa has been planted in areas that relatively free of the pest and infestations are controlled as t appear. If the infestation is not serious, it can be controlled localized application of paraquat 1-2%.

In the case of heavier infestations, we have obtained interest results with the preemergence herbicides Chlorpropham (CIPC E 50% G 20%) at rates of 6 kg a.i./ha and pronamide (=propyzamide) (Kerb W, 50% wp) at rates of 2 kg a.i./ha applied overall and incorporate

At the same time we are trying to instill in the farmers an awarene of the problem by stressing aspects that reduce the spread of the se such as cleanliness of irrigation channels and machinery, anima grazed in infested plots and especially the sanitation of harvesti machinery.

The species involved is principally Cuscuta indecora but we suspe that other species may be involved. Host species include fodder cro such as alfalfa and red clover, vegetables such as potato and toma

and some seed species as Russian thistle (Salsola kali), Koch scoparia and Chenopodium spp. We have also observed Cuscu parasitizing fruit trees in the Valllo Medio de Rio Negro.

Seed cleaning in our area involves a separator with velvet-li rollers and/or magnetic separator (Gompper) to remove the parasi from the alfalfa seed. The roller type gives seed that is 95% cle with a minimum of wastage and a yield of three or four bags (50 ea)/hr. Th magnetic separator yields seed 99% clean but wi considerable wastage. With two cleanings, it reaches a purity 100%. This is the type of cleaner most used due to its efficiency a yield (8-10 bags/hr).

E. D. Agostino, Inst. Nac. Tec. Agropecuaria, Argentina
(Letter translated by M. Turton of WRO).

Third International Symposium on Parasitic Weeds, March 1983

A third symposium on parasitic seed plants is being organized for 19 tentatively for the month of March. It will be held somewhere western Europe or in the Mediterranean region at the request c numerous IPSPRG members. Please send suggestions for any aspect c the meeting to Chris Parker or Lytton Musselman.

Sixth Symposium on Morphology, Anatomy and Systematics

Special sessions on parasitic angiosperms were held at this symposiu 9-13 March at the University of Ulm, Ulm, West Germany. The parasit sessions were organized by Dr Hans Christian Weber of the Universit of Ulm. IPSPRG was represented by members from five countries. Ther were four sessions dealing with parasitic angiosperms that include papers on a wide variety of subjects including morphology, flora biology, physiology and taxonomy of mistletoes as well as roo parasites. Papers presented at these sessions are scheduled to appea in the German botanical journal Beiträge zur Biologie der Pflanzen.

Parasitic Weed Problems

Reports of acute parasitic weed problems continue to be brought to the notice of the ODA Tropical Weeds Group at WRO. In recent months these have included accounts of Orobanche problems in eggplant., tomato and tobacco in the state of Orissa, India (from Dr. G. C. Tosh); of O. aegyptiaca and O. ramosa in N. Iraq (Dr. Shaik Mohiddin); of Cuscuta species in soybean in Northeastern China (Mr Yu, Singapore); in Trifolium species in Uruguay (Mrs Amalia Rios de Formoso); and lucerne (alfalfa) in Argentina (Ing. Eduardo dell Agostino).

Orobanche ramosa in Texas

In February 1981, Mr Kevin Nixon and Prof Marshall Johnston of t University of Texas stopped along a hwy in central Texas for lunch a much to their surprise found themselves looking down on the first n introduction of branched broomrape reported in the United States over 50 years! Later excavation revealed that the parasite w attached to a diversity of hosts from eight different families. T source of the infestation and the host range of this strain remain be determined.

LITERATURE

Lynn, D. G., J. C. Steffens, V. S. Kamut, D. W. Graden, J Shabanowitz, J. L. Riopel. 1981. Isolation and characterization c the first host recognition substance for parasitic angiosperms. J Am. Chem. Soc. 103: 1868-70. This is perhaps one of the mor significant papers to appear on the biology of parasitic angiospern since the discovery of synthetic germination stimulants. It describe the characterization of a compound that induces haustoria in parasiti Scrophulariaceae. The compound, termed xenognosin (meanin recognizing strangers), was derived from gum tragacanth.

Tsivion, Y. 1981. Suppression of axillary buds of its host b parasitising Cuscuta. 1. Competition among sings and indirec inhibition. New Phytol. 87: 91-9. The author reports experiment that confirm the very powerful "sink" effect of C. campestris growin on peas but also suggests a further form of inhibition that does no depend on intact phloem between parasite and the buds that ar suppressed. This effect may be due to a xylem transported inhibito or to some other more complex indirect effect via the root system.

Hutchinson, J. M. and F. M. Ashton. 1980. Germination of fiel dodder (Cuscuta campestris). Weed Science 28: 330-3. Studies showe that dormancy of freshly shed seed depends on an intact seed coat an there is substantial loss of this dormancy within 18 months whe exposed to cold conditions. Germination is then maximal at 27-33 and mainly from the top 3 cm in the soil.

Tsybul'skaya, G. A. and A. N. Skoklyuk. 1978 Calculating releases o Phytomyza. Zashcita Rastenii 11: 49. (in Russian) and G. A Tsybul'skaya, B. G. Degtyarov, N. A. Fedoryak, and A. N Skoklyuk. 1978. Determination of the viability of Phytomyza puparia ibid. 5: 29-30. (in Russian). These two papers describe many o the practical methods involved in collecting, rearing, storing an selecting Phytomyza material for least parasitization and greates effectiveness as a biocontrol agent against Orobanche. New techniques include the use of x-rays to determine the viability of puparia. Wh is it only in USSR that Phytomyza is being exploited?

Carafa, A. M., G. Carratu and G. F. Tucci. 1980. Ecology o parasitic Rhinantheae. Observations on the nutritional physiology o Bellardia trixago (L.) All. cultured in vivo. Annali dell, Facolta'de Scienze Agrarie della Universita'degli Studi di Napol Portici 14: 25-31. (in Italian). The authors suggest that this less

well known member o' the Rhinantheae is virtually an obligate parasi in that it cannot r(ch flowering without the benefit of organ nutrients from its hosts.

Weber, H.-C, 1981. Untersuchungen an parasitischen Scrophulariace (Rhinanthoideen) in Kultur. I. Keimung and entwicklungsweise. Flo 171: 23-38. This paper is similar in many ways to those of t famous Austrian botanist, E. Heinricher, who contributed so much our understanding of hemiparasites. Like Heinricher, Weber discuss the growth of several genera of parasitic Scrophulariaceae in cultur The germination and development of six genera of parasit Scrophulariaceae are described. The author states that all can gr(to maturity without hosts but that haustoria do not develop unle: another plant is present in the pot.

Canne, J. M. 1979. A light and scanning electron microscope study (seed morphology in Agalinis (Scrophulariaceae) and its taxonom: significance. Syst, Bot. 4: 281-96. The seeds of parasit: Scrophulariaceae are ideal subjects for SEM study and this author use these criteria for their taxonomic value.

Weber, H.-C. 1980. Zur evolution des parasitismus bei d(Scrophulariaceae und Orobanchaceae. Pl. Syst. Evol. 136: 217-3: The author suggests that the specialized parasitic organ of th Orobanchaceae has evolved from small annual root parasites by tendency to form wart-haustoria in the hypocotylar region. H supports this by pointing out that leaf haustoria occur only in th most advanced members of the family.

Parker, C. 1980. Parasitic weeds and their control in the tropics. pp 22-50 in Proc. Conf. at IITA, Ibadan, Nigeria, July 3-7, 1978 "Weeds and their control in the humid and subhumid tropics".

Musselman, L. J. 1980. The biology of Striga, Orobanche, and othe root-parasitic weeds. Annual Review of Phytopathology 18: 463-89.

HAUSTORIUM is edited by Chris Parker and Lytton Musselman and i mailed in June and December. We are thankful for the many and divers contributions to this issue and for the several supportive letters an comments. Unsigned items are by the editors. Please send materia for the next (December 1981) issue to either editor by November.

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Table 1

Cuscuta and Viscum species, their hosts, intensity of infestation and location in the middle and nortern parts of Jordan

Parasite Generic Name	Host Generic Name	Xntensity of Infesration	Location[7]
C. campestris Yunk.	Alhagi maurorum (W)[1]	S[2]	Jordan Valley
	Corchorus olitorius (C)[3]	L[4]	Alroussaifa
	Prosopis frncta (W)	S	Jordan Valley
	Trifolium alixandrinum (C)	L	Zarqa
C. epilinum Whiehl.	Artemisia herba alba (W)	S	Yajouz
	Nicotiana tabacum (C)	L	Greenhouse
C. monogyna Vahl.	Citrus deliciose (C)	L	Kreimeh
	Vitis vinifera (C)	M[5]	Irbid
C. planiflora Ten.	Capparis spinosa (W)	L	Karak
V. cruciatum Sieb.	Amygdalus communis (C)	S	Wadi Shu'aib, Ajlun
	Crataegus azarolus (F)[6]	L	Ajlun
	Olea europea (C)	None/S	Jarash to Ajlun
	Punica granatum (C)	M	Wadi Shu'aib
	Quercus sp. (F)	L	Kufr abil
	Retama raetam (F)	L	Arda Rd.
	Rhamnus palaestina (F)	S	Ajlun to Wadi rumma

[1] W = wild

[2] S = severe

[3] C = cultivated

[4] L = light

[5] M = moderate

[6] F = forest treet

[7] Locations are shown on the attached map.

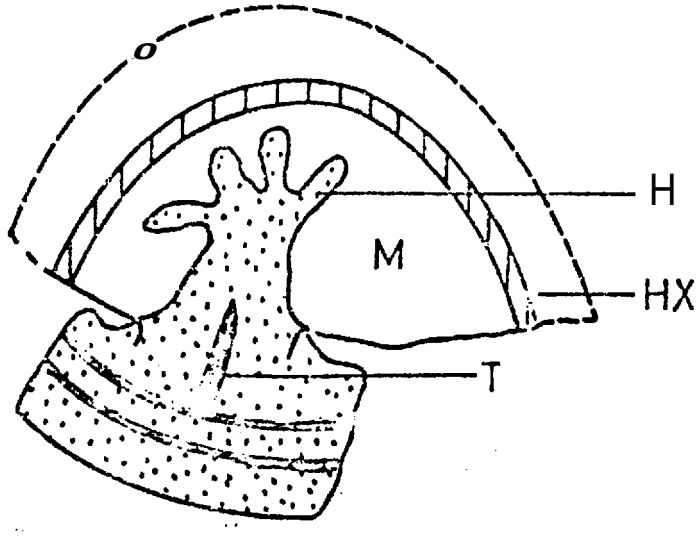

Fig. 3

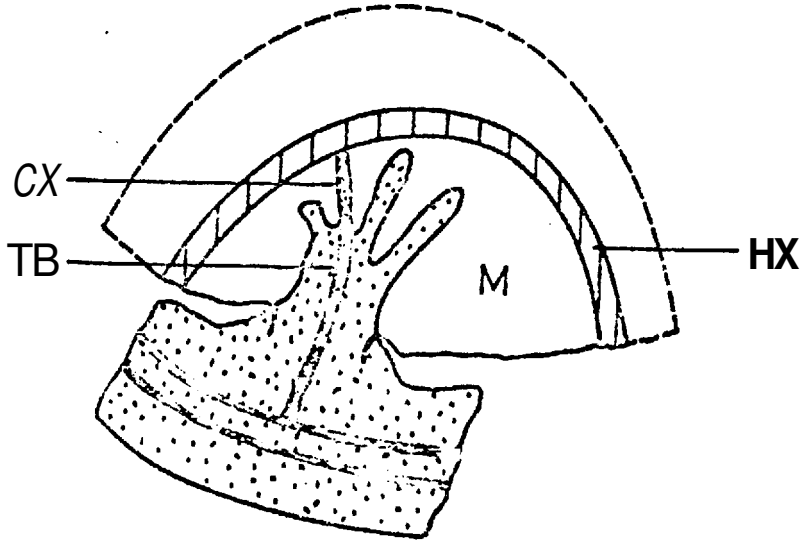

Fig. 4