changes in selective values of particular sets of genes[9], especially in the case of the locust migrating into an invasion territory with ecological conditions quite different from those of its natural habitat. The first indications in the laboratory breeding of F_1 from field collections are that increases in chiasma frequency are transmitted to offspring, irrespective of the density of populations in the cages.

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Genetically Controlled Variation in Pteridine Content of *Pieris brassicae* L.

IN various insects, simple recessive mutants which have a distinctly different pteridine content from the wild type have long been recognized[1]. This phenomenon has been particularly well investigated for the eye-pteridines of the imago of *Drosophila melanogaster*. In all these cases, the presence or concentration of one or more of the 6-substituted pteridines and/or isoxanthopterin is affected. For Pieridae, a family in which pteridines occur in great variety and large quantities, no such mutants have been described. Sexual differences in pteridine content or composition can be very marked in some species of Pieridae, for example, in *Euchloe cardamines*. Also some geographical races of *Pieris brassicae*, for example, race *cheiranthi* (Hübner) of the Canary Islands, are, because of differences in pigmentation, suspected of having a different pteridine composition.

Recently, Gardiner described two genetically controlled colour-variations of *Pieris brassicae* which appeared as mutations in a laboratory colony: *ab. coerulea* and *ab. jauni*[2]. Both these mutants differ from the wild type in the amount of yellow pigmentation: *ab. coerulea* lacks all yellow, and shows a slight blue iridescence; *ab. jauni* shows a marked increase in yellow pigmentation, especially on the underside of the hind wings. Since the yellow pigmentation of the wing scales of the wild type depends on small amounts of xanthopterin and erythropterin mixed with the much larger quantities of colourless substances, that is, leucopterin, isoxanthopterin and uric acid, it was suspected that the mutants were affected in their pteridine composition.

Wing extracts were chromatographed on paper, and the resulting chromatograms showed a marked difference in pteridine composition when viewed in ultra-violet light. Xanthopterin and erythropterin are completely lacking in *ab. coerulea*, while both these substances, especially erythropterin, are present in increased amounts in *ab. jauni*. Another colour variation in *Pieris brassicae*, *ab. albinensis*[3], does not differ from the wild type in pteridine composition. The change of colour in this mutant depends entirely on an incomplete melanin formation.

The main point of interest here is that in *Drosophila* the genetic variation in pteridine composition in all described mutants involves the 6-substituted pteridines and isoxanthopterin; while in both *ab. coerulea* and *ab. jauni* of *Pieris brassicae*, a 7-substituted pteridine (erythropterin) and xanthopterin are involved. This linkage of isoxanthopterin to 6-substituted pteridines and of xanthopterin to a 7-substituted pteridine, whenever genetically controlled variations occur, may well be an indication of a rather strong metabolic connexion. It seems that naturally occurring isoxanthopterin is an oxidative breakdown product of the 6-substituted pteridines and that naturally occurring xanthopterin is an end-product of the oxidative breakdown of 7-substituted pteridines. The bioconversion from 7-substituted pteridines to 6-substituted pteridines, as well as the bioconversion from xanthopterin to isoxanthopterin, appear to be metabolic impossibilities.

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MICROBIOLOGY

Occurrence of Nematode-trapping Fungi in the Rhizosphere

ALTHOUGH there are many species of predaceous fungi that capture and kill nematodes in soil, there are little if any data in the literature to indicate if they are preferentially stimulated by roots. Since nematodes tend to accumulate in the root zone or rhizosphere[1] we determined the incidence of nematode-trapping fungi in this region as compared with root-free soil.

Wheat and soybean were grown in pots in the greenhouse for 4–6 weeks. On removal the roots were shaken to dislodge loosely adhering soil and clumps, and sections with rhizosphere soil adhering were placed on the surface of 'Difco' corn meal agar containing 30 mg chlortetracyclene/l. to suppress bacteria. Root-free soil was distributed uniformly on plates of this agar medium at the rate of 10–20 mg per plate. Root material was also washed thoroughly in tap water and then in 5 changes of sterile water and segments of approximately 0·5 cm were placed on the agar medium. Fifty plates were prepared for each sample. To each plate was added a suspension of living nematodes of the genus *Panagrellus* (kindly supplied by Dr. E. Hansen, Kaiser Foundation Research Institute, Richmond, California, U.S.A.) to stimulate trap-formation[2] as an index of the presence of the predaceous fungi. The plates were incubated at 20° C and examined thoroughly after 3 and 6 weeks.

Table 1. PERCENTAGE OF PLATES SHOWING *Arthrobotrys* IN THE ROOT ZONE OF WHEAT AND SOYBEAN. 50 PLATES IN EACH COUNT

Plant	Root segments	Rhizosphere soil	Root-free soil
Soybean	0	86	62
Wheat	0	32	

The data given in Table 1 show an interesting distribution of fungi in the zones indicated. *Arthrobotrys oligospora* Fres. was the only nematode-trapping fungus that was consistently isolated, although in a few plates there was evidence of other types producing constricting rings, and occasionally of the endozoic predator *Harposorium*. Perhaps the most striking feature was the complete absence of *Arthrobotrys* on the root segments compared to its occurrence in the soil samples. The data strongly suggest that this fungus is a soil-inhabiting organism, in the terminology of Garrett[3]. Also noteworthy is the greater abundance of the fungus in the soybean rhizosphere as compared with that of wheat. Repetition of these experiments revealed an essentially similar relationship, implying that the type of plant used exerts a strong influence on the incidence of this fungus. Recent work from our laboratory[4] showed that under certain conditions soybean rhizosphere soil contained four times as many nematodes as wheat rhizosphere, a fact that may account