

Chromatograms of twenty-eight healthy and twenty-eight leaf-roll infected tubers revealed a striking and consistent difference in the occurrence of tryptophane and tyrosine. In chromatograms of healthy tubers, both these amino-acids were invariably found in appreciable amounts, while in those of diseased tubers no tryptophane and very little or no tyrosine was observed. This was found with aqueous as well as alcoholic extracts. Three standard chemical tests for tryptophane and tyrosine were then applied to extracts of a further twenty-five healthy and twenty-five leaf-roll infected tubers: the benzaldehyde test for tryptophane², Millon's test for tyrosine³, and Folin's test for phenolic hydroxyl compounds as in tryptophane and tyrosine⁴.

All diseased tubers gave a negative benzaldehyde test and a faintly positive Millon's and Folin's test. With the healthy tubers the following results were obtained: benzaldehyde test, 22 positive, 3 negative; Millon's test, 21 positive, 4 faintly positive; Folin's test, 24 positive, 1 faintly positive. The four tubers which gave the negative benzaldehyde test gave positive Millon's and Folin's reactions.

The reduction in the tryptophane- and tyrosine-content of tubers on infection with the leaf roll virus could be due to any one of a number of causes. It is possible that the virus molecule draws especially heavily on these two amino-acids for its formation, or diverts them into the production of other substances. It should be noted in this respect that Best⁴ has suggested a pathway for the conversion of tyrosine to scopoletin, a substance found in abnormal amounts by one of us^{5,6} in leaf-roll infected plants. This process would require the presence of tyrosinase, which is reported to be slightly more active in resting infected tubers than in healthy ones⁷. It is also possible that, instead of hastening the utilization of these amino-acids, the leaf roll virus interferes with their synthesis.

If this difference in tryptophane- and tyrosine-content proves to be specific for leaf-roll infection, then it offers promise of becoming the basis of a long sought for, simple, chemical test for the diagnosis of this disease in tubers.

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¹ Williams, R. J., and Kirby, H., *Sci.*, **107**, 481 (1948).

² Dent, C. E., Speka, W., and Steward, F. C., *Nature*, **160**, 682 (1947).

³ Hawk, Ph. B., Oser, B. L., and Summerson, W. H., "Practical Physiological Chemistry", 12th edit., 155, 126, 131 (Blakiston, Philadelphia, 1947).

⁴ Best, R. J., *Aust. J. Exp. Biol. Med. Sci.*, **28**, 223 (1948).

⁵ Andrae, W. A., *Can. J. Research*, C, **26**, 31 (1948).

⁶ Andrae, Shirley R., and Andrae, W. A., *Can. J. Research*, C, **27**, 15 (1949).

⁷ Doby, G., *Z. Pflanzenkr.*, **21**, 321 (1911).

Variations in *Aulacorthum solani* Kalt.

SOME Irish material of *Aulacorthum solani* Kalt. (Hemiptera-Aphididae) sent in for identification to the British Museum (Natural History) in 1939 showed deviation from the typical form. Progeny from the specimens submitted showed marked variation. In one case a single apterous viviparous female was observed to produce two quite different larvae, which afterwards developed into forms exhibiting accentuated differentiation.

From these observations followed a series of breeding experiments to determine the full series of variations and some food-plant preferences, including the part played by weeds of cultivated land in carrying over the species from one year to the next. These experiments extended from 1939 to 1942.

Further experiments during 1947 and 1948, and at present in progress in a heated insectary, repeat parts of the previous series. Approximately 1,500 specimens were examined and measured in the earlier experiments. Apteræ varied to the extent that they could be classified, on the basis of size, colour and principal morphological features, into three main types of large apteræ and one of dwarf apteræ, the latter showing some thirteen subsidiary variants. The alate viviparous females fell into two types of large alatae and three types of dwarf alatae, besides individuals intermediate between these types and between apteræ and alatae. The dwarf alatae, in particular, showed very marked differences in antennal measurements, distribution of rhinaria, form and pigmentation of cornicles and cauda, and abdominal ornamentation.

The existence of the several intermediates suggests that they are, in fact, variants of a single species, and that the original clone did not later become mixed with contaminants introduced accidentally with food-plants; indeed, precautions against this were specially taken.

Parallel experiments to the above were carried out on *Aulacorthum circumflexus* Buckton. The recent series of experiments on both species have made use of material from several parts of Eire as well as several localities in England. Critical tests to determine the degree to which these two species are related will be undertaken.

The question of the variations in *Aulacorthum solani* Kalt. and *A. circumflexus* Buckt. under both natural and artificial conditions, together with a discussion of the systematic position of both species, will form the subject of a further publication elsewhere. Full descriptions of the morphological characters of all forms will be included.

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Longevity in the Grey Seal

HAVING had occasion recently to consult the late Major S. S. Flower's paper¹ on the duration of life among mammals, I notice that data regarding the Phocidae (apart from *Phoca vitulina*) are extremely scanty. The only information given about the grey seal, *Halichoerus grypus*, is that one (sex unspecified) "is known to have lived for a very long time in an underground tank in the old Berlin Aquarium; it died about 1906, after, I was told, eighteen years in the Aquarium. . . . In Lincoln's Inn Fields, in the Museum of the Royal College of Surgeons, is the skull, and imperfect skeleton, of an aged Grey Seal . . . from the original Hunterian collection, which was 'stated to have been presented to Mr. Hunter by a Mr. Oxendon, probably the gentleman who went for two years in succession to the Orkney Isles for the purpose of shooting it. This animal had been known for thirty summers to come to the same rock, and lie basking in the sun.'"