
COMMUNICATIONS TO THE EDITOR

THE PRESENCE OF AN INSECTICIDAL PRINCIPLE IN THE BARK OF SOUTHERN PRICKLY ASH

Sir:

Incidental to the preparation of asarinin, which, like sesamin, increases the insecticidal effect of pyrethrum solutions,^{1,2} the observation was made that a petroleum ether extract of the bark of southern prickly ash (*Zanthoxylum clava-herculis* L.) contained, besides asarinin, a substance highly toxic to houseflies.

The insecticidal material can be extracted from the hydrocarbon solution with 90% acetic acid, leaving most of the inert and highly colored constituents. Most of the acetic acid solvent is then removed by distillation under reduced pressure, and the remainder, together with water-soluble substances, is eliminated by washing the ethereal solution of the extractives. Further purification can be attained by hot extraction of the concentrate with ligroin and removal of the solvent.

By these steps a light-colored, semi-solid product is obtained which in its toxic action on flies is apparently similar to pyrethrum. The best material so far obtained is undoubtedly a complex mixture, from which we hope to isolate the specific constituent.

(1) Haller, McGovran, Goodhue and Sullivan, *THIS JOURNAL*, in press.

(2) Haller, LaForge and Sullivan, *ibid.*, in press.

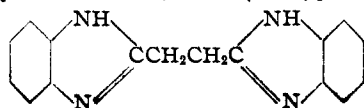
U. S. DEPARTMENT OF AGRICULTURE F. B. LAFORGE
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BELTSVILLE, MD.

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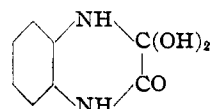
BIS-BENZIMIDAZOLES

Sir:

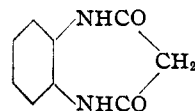
Shriner and Upson [*THIS JOURNAL*, 63, 2277 (1941)] describe the formation of *bis*-benzimidazoles by the condensation of *o*-phenylenediamine (2 moles) with dibasic acids (1 mole) in the presence of hot dilute hydrochloric acid, and, in particular, refer to the *bis*-benzimidazole obtained by the use of succinic acid. This compound was described by the writer as α,β -dibenziminazolyethane in 1928 and was prepared by a similar method [*J. Chem. Soc.*, 2393 (1928)]



Shriner and Upson also refer to the condensation of *o*-phenylenediamine with oxalic and malonic acids, respectively, and confirm the present writer's observation that the former gives 2,3-dihydroxyquinoxaline which was obtained by him as a "hydrate" probably of the structure



The product obtained by Shriner and Upson by the use of malonic acid and described by them as a compound different from any previously prepared and given the formula $C_9H_8O_2N_2$ is almost certainly the same as that prepared by the present writer by the same method and shown by him to be *o*-phenylenemalonamide (Phillips, *loc. cit.*, 2394, 2398)



This compound was also described by Meyer and his co-workers in a paper also cited by Shriner and Upson [*Ann.*, 347, 17 (1906)].

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RECEIVED OCTOBER 25, 1941

BIS-BENZIMIDAZOLES

Sir:

A careful reading of our note [*THIS JOURNAL*, 63, 2277 (1941)] will show that the previous work of Meyer and of Phillips was cited and the references given. Succinic acid was merely one of nine dibasic acids used and was included in order to have the complete series of compounds and to obtain its decomposition point since previous workers merely stated it melted above 300°. Specific credit to Phillips was cited for the formation of 2,3-dihydroxyquinoxaline. Reference to *o*-phenylenemalonamide is given in the third sentence of the note (it is a cyclic diamide). Whether our product (d. 345-349°) is identical with the above can only be determined by experiment. The reaction leading to the high melting insoluble product involves two bifunctional molecules