PHOTOINDUCED DECOMPOSITION OF FUSARIC ACID WITH THE LOSS OF ETHYLENE

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In a study of the role of the metabolites of the fungus *Fusarium oxysporum* Schlecht in plant pathogenesis, we were the first to discover that aqueous solutions of one such metabolite, 5-butylpicolinic acid (fusaric acid), are capable of releasing ethylene upon irradiation. A total of 0.24 ± 0.02 μl ethylene per hour is released upon the irradiation of 1 ml 0.01 mole/liter aqueous fusaric acid. The solutions were irradiated with a DRI-2000-6 lamp with output of 70 klux and maximum at 200-500 nm. Ethylene was detected by gas-liquid chromatography. UV analysis of the solution of fusaric acid after prolonged irradiation showed the complete absence of the pyridine ring in the solution, i.e., we have discovered the first case of the photodecomposition of the pyridine ring.

A study was carried out on the effect of pH of the medium and a number of metal ions such as Co^{2+}, Fe^{3+}, Cu^{2+}, Ni^{2+}, and Zn^{2+} on the capacity of aqueous solutions of fusaric acid to release ethylene upon irradiation. Ethylene liberation is strongly inhibited in acid media. Only 0.015 ± 0.001 μl ethylene per hour is released upon the irradiation of 1 ml 0.01 mole/liter aqueous fusaric acid in 0.15 N hydrochloric acid. Co^{2+}, Cu^{2+}, and Ni^{2+} ions at concentrations of 0.01 mole/liter completely inhibit ethylene release by fusaric acid solutions, while Fe^{3+} ions at the same concentration decrease the release of ethylene by an order of magnitude. Zn^{2+} ions at a concentration of 0.01 mole/liter, on the other hand, enhance the release of ethylene from fusaric acid both in neutral and acid media. Zn^{2+} ions increase the release of ethylene from 1 ml 0.01 mole/liter fusaric acid to 0.68 ± 0.005 μl per hour in neutral media and to 0.33 ± 0.02 μl per hour in acid media.

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