Photosynthetic Electron Transport Inhibition by Pyrimidines and Pyridines Substituted with Benzylamino, Methyl and Trifluoromethyl Groups

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Z. Naturforsch. **56 c,** 203–210 (2001); received January 22, 2001

PET Inhibitory Activity, Atrazine-Resistant *Chenopodium album*, 4-Benzylamino-2-methyl-6-trifluoromethylpyrimidines

The decrease of the number of ring nitrogen atoms of 2-benzylamino-4-methyl-6-trifluoromethyl-1,3,5-triazines on herbicidal activity and inhibition of photosynthetic electron transport (PET) was assayed using thylakoids from *Spinacia oleracea* or atrazine-resistant *Chenopodium album*. Three 2-benzylamino-4-methyl-6-trifluoromethyl-1,3,5-triazines, nine pyrimidines with a benzylamino-, methyl- and trifluoromethyl-group, 2-benzylamino-6-methyl-4-trifluoromethyl- pyridine and *N*-benzyl-3-methyl-5-trifluoromethylaniline were synthesized and assayed. 2-(4-Bromobenzylamino)-4-methyl-6-trifluoromethylpyrimidine exhibited the highest PET inhibitory activity against *Spinacia oleracea* thylakoids of all compounds tested. The 2-benzylaminopyrimidines and 2-methylpyrimidines having a 4-halobenzylamino group exhibited higher PET inhibition than atrazine and 2-trifluoromethylpyrimidines against *Spinacia oleracea* thylakoids. These PET inhibitory active compounds also exhibited a strong and similar inhibition both against atrazine-resistant *Chenopodium album* thylakoids as well as against thylakoids from wild-type *Chenopodium*. The herbicidal activity of 4-(4-bromobenzylamino)-2-methyl-6- trifluoromethylpyrimidine was equivalent to that of known herbicides like simetryne, simazine or atrazine.