

Note

Thin-layer chromatography of cytokinins

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Certain derivatives of adenine act as plant hormones (cytokinins) and a number of compounds of this type have been found in nature. Some of them are present in various tissues as free low-molecular-weight components¹, whereas some are an integral part of specific tRNA molecules². Synthetic cytokinins have also been studied¹.

We have studied the metabolism³⁻⁶ and the biological effects⁷ of natural cytokinins. It was necessary to develop methods for the reliable detection of cytokinins and products of their metabolism, and we chose paper^{3,5} and thin-layer chromatography. These methods have the advantage that it is possible to choose a solvent, that permits a good separation of various products of cytokinin metabolism. Moreover, elution, re-chromatography and scanning of radioactively labelled compounds are possible.

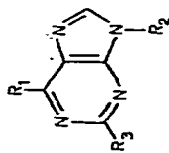
EXPERIMENTAL AND RESULTS

Thin-layer chromatography was carried out after the application of 10 μg of cytokinins on commercially available Silufof (UV 254) silical gel foils (Kavalier Sklářny, Czechoslovakia). The following solvents were used: (A) ethanol-0.1 *M* ammonium borate, pH 9.0 (1:9); (B) 1-butanol-2.5% ammonia solution (84:16); and (C) 1-butanol saturated with water. The separated compounds were detected in UV light.

The R_F values of some natural and synthetic cytokinins and several of their degradation products are given in Table I.

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TABLE I
RESULTS OF THIN-LAYER CHROMATOGRAPHY OF CYTOKININS AND THEIR DEGRADATION PRODUCTS



Compound	R ₁	R ₂	R ₃	R _F		
				A	B	C
N ⁶ -(Δ^2 -Isopentenyl)adenosine	-NH-CH ₂ -CH=C <div style="display: flex; justify-content: space-around; width: 100px;"> CH₃ CH₃ </div>	-ribose	-H	0.53	0.60	0.80
N ⁶ -(Δ^2 -Isopentenyl)adenine	-NH-CH ₂ -CH=C <div style="display: flex; justify-content: space-around; width: 100px;"> CH₃ CH₃ </div>	-H	-H	0.39	0.79	0.76
<i>trans</i> -Zeatin riboside	-NH-CH ₂ -CH=C <div style="display: flex; justify-content: space-around; width: 100px;"> CH₃ CH₂OH </div>	-ribose	-H	0.50	0.40	0.53

<i>trans</i> -Zcatin		-H	-H	0.37	0.62	0.50
N ⁶ -Benzylaminopurine		-H	-H	0.43	0.78	0.73
N ⁶ -Furfurylaminopurine		-H	-H	0.47	0.73	0.65
2-Methylthio-N ⁶ -(Δ ² -isopentenyl)adenosine		-ribose	-SCH ₃	0.52	0.65	0.82
<i>trans</i> -2-Methylthiozeatin riboside		-ribose	-SCH ₃	0.71	0.54	0.68
Adenosine	-NH ₂	-ribose	-H	0.68	0.31	0.45
Adenine	-NH ₂	-H	-H	0.52	0.43	0.46
Inosine	-OH	-ribose	-H	0.80	0.16	0.37
Hypoxanthine	-OH	-H	-H	0.76	0.27	0.48

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