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A Comparison of Zonal Scans and Strip Scans of Thin-Layer Chromatograms

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NOTE

A Comparison of Zonal Scans and Strip Scans of Thin-Layer Chromatograms*

The most accurate methods for determining the distribution of radioactivity on thin-layer chromatograms are zonal scanning (*1,2*) and strip scanning (*3*). The present communication records the comparison of these two methods in regard to sensitivity and degree of resolution. Various activities of ^{14}C-labeled lipids were separated on chromatostrips for quantitative radioassay. The zonal scans were prepared with an automatic scraping device (*1*). A Packard Radiochromatogram Scanner, Model 7200, was used to scan the chromatostrips before the scraping of 2-mm zones. Settings for the strip scanner were at the highest sensitivity that was compatible with background noise: gas flow, 300 cc; voltage, 1150 volts; chart speed, 1.0 cm/min; time constant, 10; and linear range, 300.

Figure 1 demonstrates the increased sensitivity and superiority of resolution of zonal-scan analysis over windowless strip scanning. Zonal scanning with an automatic scraper and sample collector revealed the same radioactivity peaks for the plate containing 280 dpm (Plate C) as for the plate containing the highest quantity of radioactivity (Plate A, 11,570 dpm). In contrast, the various activity peaks along the chromatostrip became obscure if strip scanning was used for their detection. Obviously, not only the sensitivity is much greater in zonal scanning, but also the degree of resolution for detecting the separations is significantly better. The great advantage of zonal scanning over strip scanning becomes even more apparent in work with ^{3}H-labeled compounds. Because of

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its greater sensitivity, the use of zonal scanning is mandatory in work with biological specimens.

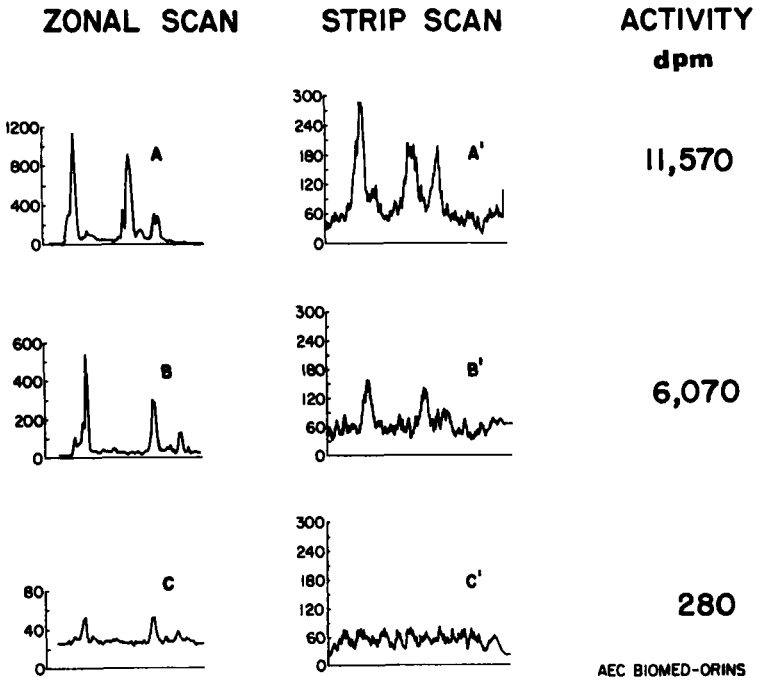

FIG. 1. Strip and zonal scans (2-mm) of a ^{14}C-labeled lipid mixture separated on Silica Gel G in a solvent system of hexane:diethyl ether:glacial acetic acid (80:20:1 v/v/v). The numbers along the ordinate represent counts per minute.

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