previous reports had already indicated such damage, and their own work provides statistically significant evidence in favor of the hypothesis that LSD users sustain chromosome damage.

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Reference

1. W. D. Loughman, T. W. Sargent, D. M. Israelstam, *Science* **158**, 508 (1967).

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Slatis has raised a single valid point. The chromosome-per-cell distributions displayed in our Table 3 (*1*) are different in a statistical sense. Lumping nonmodal cells and testing them against modal cells, with a 2 by 2 contingency chi-square test ("Fisher's exact method"?), does give $P = .044$, indicating the difference is significant. A heterogeneity chi-square test, to determine which values if any raise the chi-square disproportionately, shows that the 42-chromosome class accounts for over one-fourth of total chi-square. This class contains less than 2 percent of the observations, and is 11 percent of the total classes. We believe that the large random errors in the eight (subject) subgroups, when the data were combined, produced one of the nine-chromosome number classes with errors adding mostly in the same direction. This is acceptable as a chance event. Ignoring that class, or weighting all classes with estimated variances, brings the probability associated with total chi-square to a value above .05, indicating no significant difference in the distributions, which was our conclusion. We do understand that the data as given could support some contention about LSD-induced cellular damage, but we believe the evidence is far from convincing. The data cannot support an argument that the chromosomes themselves were damaged.

When the chromosome aberration data were examined, Slatis compared the ratios 3/697 and 0/112. Our *t*-test for the significance of the difference between the two proportions gives $t = .696$, $P =$ somewhat higher than .5. The difference can thus be attributed to chance variation, as Slatis has indicated with his value of .64. It is evident that conclusions with regard to the cause and effect of chromosome aberration, based on this value, are not reliable.

Slatis has analyzed our "micronucleated cell" observations with closeness. However, we stated that we could not put numbers on our observations. We do recognize the implications of such damage in our experimental cell populations, if the observations were significantly elevated above control values. We cannot say that they were, or that they were not.

We feel that Slatis' attempt to show chromosome damage by pointing to differences which are the result of random sampling error is not a matter of a one-tailed or a two-tailed test.

We agree that the pertinent statistical tests, at least for data in our Table 2, should be one-tailed. In fact, our conclusions were based on one-tailed *t*-tests, the full results of which were not tabulated. The confidence limits given with our data were for the convenience of readers who wished to inform themselves of the magnitude of random sampling errors associated with the percentages in the table. They were not, in themselves, part of any statistical test.

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References

1. W. D. Loughman, T. W. Sargent, D. M. Israelstam, *Science* **158**, 508 (1967).
2. G. W. Snedecor, *Statistical Methods* (Iowa State College Press, Ames, 1956), p. 25.

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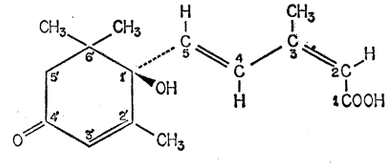
Abscisic Acid: A New Name for Abscisin II (Dormin)

Abscisin II was the name given to the second of two abscission-accelerating substances isolated (*1*) from cotton fruit. The same substance was subsequently isolated (*2*) from sycamore leaves as the result of a search for a "dormin" [an endogenous substance inducing dormancy (*3*)]. Since then, the substance has been identified in a large number of higher plants. The structure of abscisin II has been determined and confirmed by synthesis (*4*); structure and correct absolute configuration (*5*) are shown by the insert.



(*S*)-ABSCISIC ACID

Some confusion has developed from the use of the two names, abscisin II and dormin, derived from the abscission and dormancy effects of the compound. The more recent discovery of several other physiological effects has emphasized the need for an agreed terminology.

We now propose the term abscisic acid as a reasonable and useful compromise which gives an indication of the compound's chemical nature, facilitates naming derivatives, and is close enough to the original name to avoid confusion arising from the change.

We suggest that authors specify racemic abscisic acid when they use it in experiments by calling it (*RS*)-abscisic acid, and that the naturally occurring enantiomorph be called (*S*)-abscisic acid when it is necessary to draw attention to the stereochemistry. As an abbreviation for abscisic acid, we propose ABA. For specifying positions within the molecule, the numbering system shown in the figure (which conforms to the systematic name for the substance) is recommended. We propose that the question of renaming abscisin I be deferred until its structure is known.

The foregoing proposals were agreed at the Sixth International Conference on Plant Growth Substances (Ottawa, 1967) and are published in the proceedings of that conference.

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References

1. W.-C. Liu and H. R. Carns, *Science* **134**, 384 (1961); K. Ohkuma, J. L. Lyon, F. T. Addicott, O. E. Smith, *ibid.* **142**, 1592 (1963); F. T. Addicott, H. R. Carns, J. L. Lyon, O. E. Smith, J. L. McMeans, *Colloq. Int. Centre Nat. Rech. Sci. Paris* **123**, 687 (1964).
2. J. W. Cornforth, B. V. Milborrow, G. Ryback, P. F. Wareing, *Nature* **205**, 1269 (1965).
3. C. F. Eagles and P. F. Wareing, *ibid.* **199**, 874 (1963); P. F. Wareing, C. F. Eagles, P. M. Robinson, *Colloq. Int. Centre Nat. Rech. Sci. Paris* **123**, 377 (1964).
4. K. Ohkuma, F. T. Addicott, O. E. Smith, W. E. Thiessen, *Tetrahedron Letters* **1965**, 2529 (1965); J. W. Cornforth, B. V. Milborrow, G. Ryback, *Nature* **206**, 715 (1965).
5. J. W. Cornforth, W. Draber, B. V. Milborrow, G. Ryback, *Chem. Commun.* **1967**, 114 (1967).

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