Letter to the Editor

Rapid Disappearance of Cyclopropenoid Fatty Acids (CPFA) During Germination of Cottonseed

Sirs:

During a detailed investigation of the changes occurring during germination of *Gossypium hirsutum* (Hybrid-4 and Laxmi varieties popularly grown in India) and *Gossypium barbadense* (Suvin variety), it was observed that over 90% of CPFA originally present in the seed was altered when seeds were germinated for six days, even though the reduction in oil content during the period was much lower (Fig. 1). This observation has not been made in earlier studies (1,2), where the changes occurring in major fatty acids of the oils were reported and discussed.

Authentic samples of the three varieties of cottonseeds were obtained; Hybrid-4 and Laxmi seeds were delinted by the H_2SO_4 method and the seeds were allowed to dry on filter paper under ambient conditions. The Suvin variety of seeds were not delinted, as they were bald. Fifty air-dried seeds of known weight were soaked in distilled water for 10 min and allowed to germinate on two pieces of wet filter paper. The original seeds and the seeds after two, four and six days of germination were analyzed for oil content. The CPFA content of the hexane-extracted oil was quantitatively estimated from the intensity of the color developed after treatment with Halphen Reagent according to standard procedures (3).

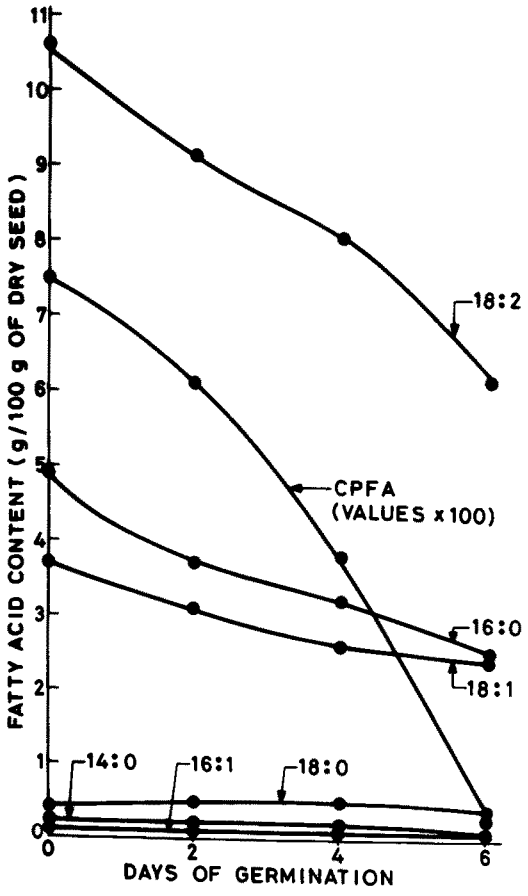

FIG. 1. Progressive changes in the amounts of CPFA and other fatty acids in germinating cottonseed.

In all three varieties, the oil content decreased progressively, but the percentage reduction in a given time differed from variety to variety. In the Laxmi variety the reduction in oil content for six days was only 14.4%, while the highest was 41.3% for the Hybrid-4 variety; in the Suvin variety, the reduction in oil content was between the other two (25.3%).

In all cases, the reduction in CPFA content, as estimated by Halphen Test procedure, was over 90% in six days, which indicates that major changes occurred in the cyclopropenoid fatty acids during the initial stages of germination.

There were only minor differences in the fatty acid composition of the hexane-extracted oils as determined by GLC; the amount of individual acids (calculated as gm/100 gm of dry seed) progressively decreased in all cases except for stearic acid, as can be seen in Figure 1, which represents data during germination of the Hybrid-4 variety. The % reduction in CPFA content of the seed was much more than those of major fatty acids at any given period.

It may be pointed out that during germination of all the three varieties, free and total gossypol content of seed, determined by standard AOCS method (3), decreased progressively.

Sudha S. Pandey and V.V.R. Subrahmanyam
Department of Chemical Technology
University of Bombay
Bombay-400 019, India

ACKNOWLEDGMENTS

S. N. Pandey of Cotton Technological Research Laboratory, Bombay, provided samples and facilities for the work.

REFERENCES

1. El-Nockrashy, A.S., H.M. Mostafa, Y. El-Shattory and M.H. Abbassy, *Nahrung 18*:275 (1974).
2. Joshi, A.C., and V.M. Doctor, *Lipids 10*:191 (1975).
3. *Official and Tentative Methods of the American Oil Chemists' Society, Vols. I & II*, 3rd edn., AOCS, Champaign, IL, 1964 (revised to 1977).

[Received April 15, 1985]