

SHORT COMMUNICATION

GIBBERELIC ACID IN THE FLORAL PARTS OF *CASSIA FISTULA*

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Abstract—The presence of gibberellic acid (GA_3) in the petals and stamens of *Cassia fistula* is reported on the basis of chromatography, bioassays, spectrofluorometry, superimposed i.r. spectrum and mass fragmentation pattern. The yield is 5 mg in the petals and 2 mg each in the filaments and anthers per kg fresh wt.

THE PRESENCE of indole auxin and inhibitors in the fast-growing long cylindrical pods of *Cassia fistula* (Leguminosae) has been reported previously.¹ It is interesting to note that indole auxin reaches a peak value before the seeds in the fruits are fully mature but at maturity the level drops to zero; at the same time, inhibitors accumulate in the fruit. Despite these facts, the fruit grows vigorously and shows remarkable elongation. This led the authors to investigate the endogenous gibberellins in the floral parts and the developing fruits of the plant. The present communication shows a fairly high concentration of GA_3 in the petals and stamens of the plant. There are few other reports of the isolation of GA_3 from flowers. Tepfer and Karpoff² observed that a high concentration of GA_3 is related to the morphological development of carpel and stamen in the flower of *Aquilegia* cultured in nutrient medium.

EXPERIMENTAL

1 kg petal of *Cassia fistula* collected during April was extracted with acetone. The concentrated mass was extracted thrice with equal volume of ether and subsequently with 3 per cent NaOH. The alkali extract, after washing with ether, was acidified and extracted thrice with ether. The ethereal layer was concentrated and chromatographed on a silica gel column (50 cm \times 2.5 cm). The column was eluted successively with petroleum ether (60–80), petroleum ether–benzene (1:1) benzene, benzene– $CHCl_3$ (3:1), Benzene– $CHCl_3$ (1:1) and $CHCl_3$. From the $CHCl_3$ eluate a colourless residue was obtained which was crystallized from $CHCl_3$ –petroleum ether and melted at 229°. The substance had a yellow-green fluorescence (after spraying with 70% H_2SO_4) in u.v. light and the same R_f s on paper and TLC as GA_3 . The yield of GA_3 was approximately 5 mg per kg of fresh petals. The gibberellin activity of the compound was confirmed by means of the lettuce hypocotyl, α -amylase, dwarf rice leaf-sheath tests.

The identity of the crystalline substance was established by direct comparison of physical properties, i.r. spectrum and spectrofluorometric properties³ with those of authentic sample. Mass spectral examination of the methyl ester showed a molecular ion peak at $M + m/e$ 360 and there are peaks at m/e 342, 301, 282, 239, 136 which are in accord with the peaks obtained from spectral analysis of authentic GA_3 .

The same procedure was followed for the extraction and identification of GA_3 from anthers and filaments of the flower. The yield in both the cases was 2 mg per kg of fresh wt. In addition to GA_3 , the initial $CHCl_3$ eluates of the anther extract showed other minor spots which gave yellow-green fluorescence (after spraying

¹ R. K. MUKHERJEE, ARATI BHANJA and S. M. SIRCAR, *Physiol Plantarum*, **19**, 448 (1966).

² S. S. TEPPER and A. J. KARPOFF, *Bull. Soc. Franc. Physiol. Vegetale* **11** (3), 226 (1965).

³ G. W. ELSON, D. F. JONES, J. MACMILLAN and P. J. SUTER, *Phytochem.* **3**, 93 (1964).

with 70% H_2SO_4) at R_f 0.20 and 0.32 on TLC plates developed in benzene:EtOAc (90:10); the precise nature of these spots has not yet been determined.

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