Identity of the *Pisum* Gibberellin

Conflicting reports exist as to the main gibberellin in *Pisum sativum* L. This report is consistent with the findings of Komoda *et al.* who reported gibberellin A_{20}(GA_{20}) on the basis of an infrared comparison. A differentiation between GA_5 and the *Pisum* gibberellin (PG) by thin layer chromatography (TLC) is described.

The main gibberellin of *Pisum sativum* L. has recently been reported as GA_5 on the bases of bioassays and TLC data (Reinhard and Konopka, 1967). More recently, GA_{20} has been reported by Komoda *et al.* (1968) in pea pods of the same species. In an attempt to obtain GA_5 from this source, the gibberellins in 1.3 kg of freshly picked and frozen peas were extracted as previously described (Kimura, 1967, 1969).

Examination by TLC, of the fraction containing the principal gibberellin-like biological activity on dwarf peas, revealed the presence of a substance with the R_f values of GA_5 (Table I) as anticipated. However, during fluorescence development on 70% sulfuric acid sprayed TLC plate, GA_5 developed fluorescence to a visible intensity in 10 minutes at 120° C., while the PG showed no fluorescence in this length of time but only after an additional 20 minutes at 120° C. The conditions for fluorescence development of the PG and the *Vicia* gibberellin (VG, Kimura, 1969) were identical. The VG is believed to be GA_{20} (the *Pharbitis*, Takahashi *et al.*, 1967).

Simultaneous chromatography (Figure 1) of GA_5, PG, and the VG on silica gel in benzene–acetic acid–water (8:3:5), a system used to differentiate GA_5 and the VG, revealed that the PG and VG are identical not only in their fluorescence developmental characteristics but also chromatographically and, therefore, are likely to be identical gibberellins. GA_5, which can be isolated under identical conditions as the PG, was absent. This is consistent with the findings of Komoda *et al.* who found GA_{20} but no GA_5.

Table I. Relative Mobilities of *Pisum* Gibberellin (PG) and Gibberellin A_5 (GA_5) in Various TLC Solvent Systems

TLC System[a]	R_f PG	R_f GA_5
Ethyl acetate–acetic acid (95:5)	0.47	0.47
Benzene–1-butanol–acetic acid (14:5:1)	0.46	0.46
Isopropanol–4.5 *N* ammonium hydroxide (3:1)	0.57	0.57
Ethyl acetate–chloroform–acetic acid (15:5:1)	0.38	0.38
Isopropyl ether–acetic acid (95:5)	0.15	0.15
Methyl acetate–2-propanol–ammonium hydroxide (45:35:20)	0.39	0.41
1-Butanol–4.5 *N* ammonium hydroxide (3:1)	0.27	0.27
Benzene–acetic acid–water (8:3:5)[b]	0.35	0.32

[a] Precoated silica gel plates (Brinkmann Instruments) were used unless otherwise specified.
[b] The R_f value of the *Vicia* gibberellin was 0.35 on the same silica gel G plate.

While it is possible that this apparent deviation is due to a varietal difference in peas or to a time difference in sampling, none of the TLC solvent-plate systems used by Reinhard and Konopka are likely to differentiate the PG and GA_5. The benzene–acetic acid–water system, although used, was used only in connection with the kieselguhr plate. A heating time of an uninterrupted 20 minutes precludes the possibility of differentiation by fluorescence developmental characteristics.

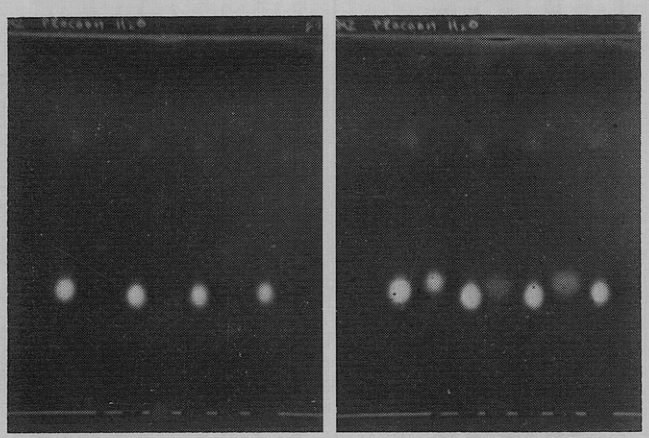

Figure 1. TLC comparison of gibberellin A_5 (GA_5) *Vicia* gibberellin (VG), and the *Pisum* gibberellin (PG)

The silica gel G plate was developed in the upper phase of benzene–acetic acid–water (8:3:5) after 16 hours of equilibration in the vapors of both phases. Left: after 10 minutes of heating, the intense spots are all GA_5. Right: same plate, after 30 minutes of heating, additional spots, left to right, are VG, PG, and PG

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