INHIBITION OF INDOLE-3-BUTYRIC ACID PROMOTED ROOTING BY GIBBERELLIC ACID AND ACRIFLAVINE IN COWPEA HYPOCOTYL CUTTINGS

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AFTER the pioneering work of Went[1], it has been well established that auxin is an important regulator of root formation. On the contrary, gibberellic acid is reported to inhibit root induction in excised cuttings[2-4] of many genera and to promote in few others[5-7]. The present investigation has been undertaken to study the effect of IBA, GA_3 and acriflavine alone or in conjunction on rooting in excised hypocotyl cuttings of cowpea. Acriflavine, 2,8-diaminoacridine methochloride, is a deep orange crystalline substance possessing bacteriostatic and bactericidal properties employed in wound dressings[8].

Seeds of cowpea, *Vigna sinensis* Endl. Cv. Co_3 were obtained from the Pulses section of Tamil Nadu Agricultural University, Coimbatore. Seedlings were raised in earthern pots containing garden soil. From the 6-day old seedlings, hypocotyls of uniform length (about 12 cm) were excised. The cuttings were divided into 9 batches of 10 each. One batch was kept as control by dipping the basal parts of the cuttings in distilled water and the rest were subjected to treatment with IBA, GA_3 and acriflavine (alone or in different combinations, Table I) for 2 days. On the 3rd day, the cuttings were transferred to distilled water in which they were maintained for another 14 days with change of water on alternate days. The test-tubes containing the cuttings were wrapped with black paper with the projecting shoot portions exposed to diffuse light in the laboratory. The average maximum and minimum temperatures during the experimental period were 28·6° C and 21·7° C respectively. Observations and the recorded data for duplicate experiments are given in Table I. After preliminary investigations, the concentrations of IBA and GA_3 that are most effective in root induction in hypocotyl cuttings were decided.

The experimental results suggest that IBA markedly stimulates adventitious root formation. GA_3 and acriflavine suppress rooting. With the increase in the concentration of acriflavine the suppression of rooting is accentuated. IBA-promoted rooting is reduced to nearly 62% by GA_3 when it is used in conjunction with IBA. In acriflavine and IBA combination, rooting is further suppressed. When IBA, GA_3 and acriflavine are used in combination, the IBA stimulated-rooting, to a great extent, but this is inhibited by the cumulative effect of GA_3 and acriflavine. Even the percentage of rooted cuttings and the day on which visible root primordia appear on cuttings, in each treatment vary (Table I). Rooting is delayed by 2 days in GA_3 treated cuttings, 1-2 days in

TABLE I

Treatment	Day on which visible root primordia appear	Average number of roots per cutting on the day of termination of the experiment	Percentage of rooted cuttings on the day of termination of the experiment
1. Control	5	20·7±1·1[a]	100
2. IBA (5 mg/l)	4	39·1±2·0[a]	100
3. GA_3 (5 mg/l)	7	12·4±0·6[a]	100
4. Acriflavine (5 mg/l)	6	9·8±0·7[a]	100
5. Acriflavine (10 mg/l)	7	4·8±0·2[a]	90
6. IBA (5 mg/l) + GA_3 (5 mg/l)	5	15·1±0·7[a]	100
7. IBA (5 mg/l) + acriflavine (5 mg/l)	5	11·6±0·4[a]	100
8. IBA (5 mg/l) + acriflavine (10 mg/l)	6	7·8±0·4[a]	100
9. IBA (5 mg/l) + GA_3 (5 mg/l) + acriflavine (10 mg/l)	8	3·4±0·2[a]	80

[a] Refers to standard error.
Data presented are average of duplicate experiments, each experiment with 10 replicates for each treatment.

acryflavine treated cuttings and 3 days in cuttings treated by a combination of IBA, GA_3 and acriflavine. Since gibberellins have a function in regulating nucleic acid and protein synthesis, GA_3 may be suppressing root initiation by interfering with the aforesaid processes[9].

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RUSSULA FOETENS (PERS.) FR.— A NEW RECORD FOR INDIA

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From amongst the mushroom collection of North India, made in August 1979, one of the specimens was identified as *Russula foetens* (Pers.) Fr. Though 275 species of *Russula* Pers. ex Gray are known from world over[4], only 7 species are reported from India[1]. The present one is a new addition to the list of Indian species. Colour terminology used is after *Methuen Handbook of Colour*[2]. The specimen has been deposited in the Herbarium of Botany Department, Punjabi University, Patiala and duplicate collection in the Herbarium of Field Museum of Natural History, Chicago, Illinois, U.S.A. The detailed description of the species is as follows:

Russula foetens (Pers.) Fr., Epicr. Syst. Myc. p. 359, 1838. Fig. 1 (A–D).

Fructifications up to 12 cm in height; pileus up to 10 cm broad, convex when young, applanate with a depression in the centre at maturity, margin sulcate, striate, pellucid, surface viscid, sticky when moist, glabrous, brown: 6B8 in the centre, light orange; 5A4 along the margin, flesh colour not changing when cut, latex absent, taste tardily acrid, odour oily. Lamellae subdecurrent, crowded, rarely forked, broad, lamellulae few, yellowish white: 1A2, no change when bruised, edges wavy. Stipe up to 10 × 2·2 cm, slightly tapering downwards, veined, pruinose, fleshy, solid, becoming hollow with age, yellowish white: 1A2, no change when cut. Spores 6–8·3 × 6–7·6 μm, globose to subglobose, verrucose, warts upto 1·5 μm, ornamentation type IV[a], apiculus upto 1·5 μm long, deposit pale yellow: 4A3, amyloid. Basidia 38–47, × 7·6–10 μm, 2 and 4 spored, clavate, sterigmata upto 6 μm long; pleurocystidia 51–89·8 × 7·6–10·6 μm, almost fusoid, cylindrical, appendiculate, impregnated with contents towards the apex, abundant; cheilocystidia absent. Cap context heterogeneous, epicutis hyphal, subgelatious; dermatocystidia absent; gill trama and stipe context heterogeneous.

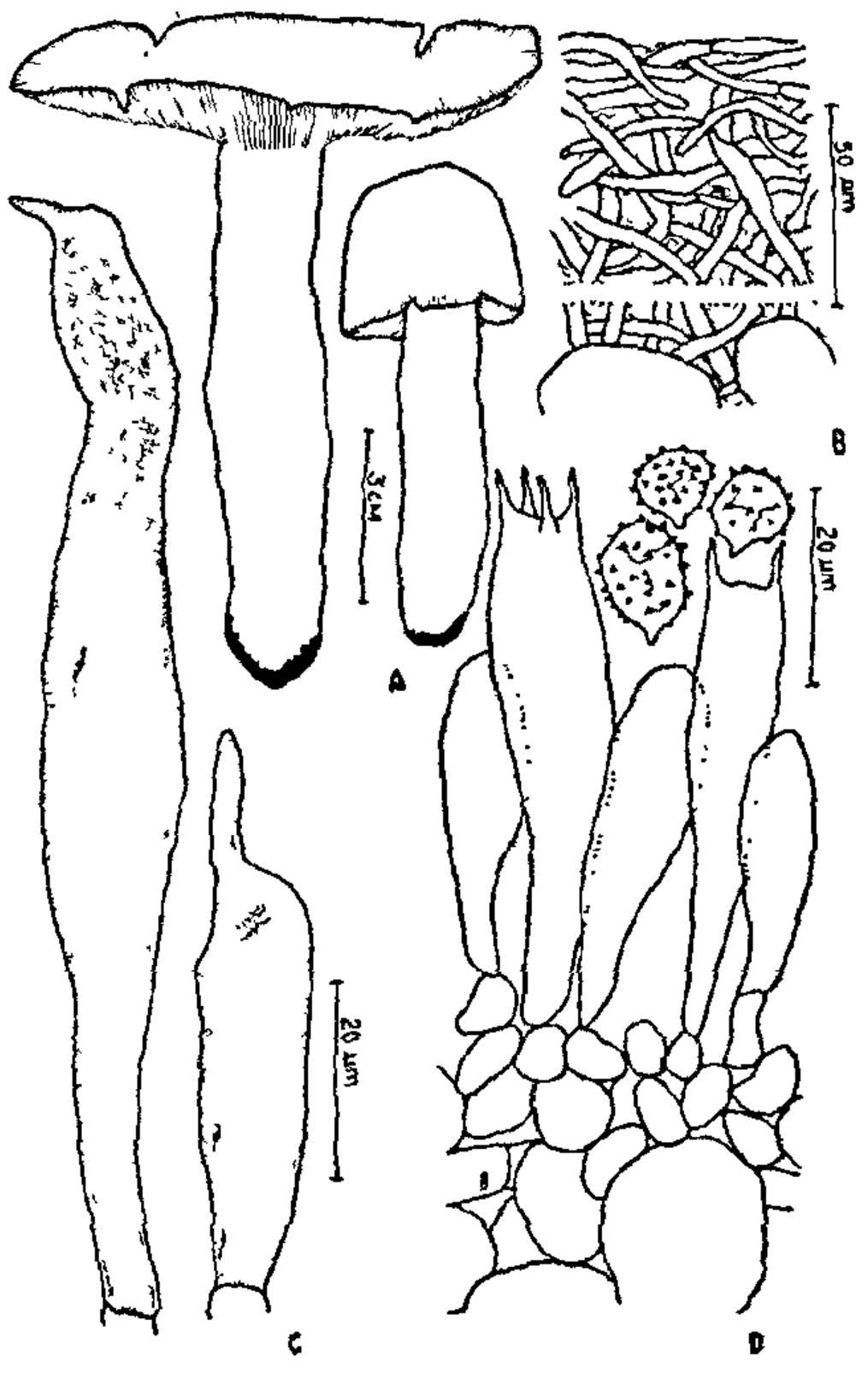

Fig. 1. (A–D). *Russula foetens* (Pers.) Fr. A, Carpophores; B, V.S. pileus showing heterogeneous context; C, Pleurocystidia; D, V.S. Hymenium showing basidia, basidiospores and heterogeneous trama.