variation, rather it was the developmental stage of the seed which made the difference in the NR activity in the seed. Thus, a common type of change in ten varieties is being used here to generalize the process in cotton as whole (Fig. 1).

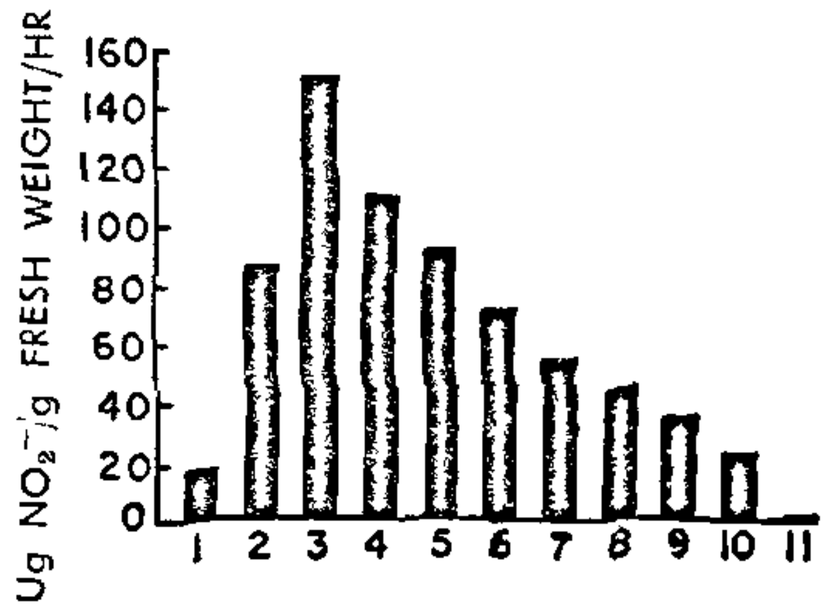

FIG. 1. Nitrate reductase activity in developing Cotton Ovules/Seeds. 1—Anthesis ; 2—Fertilization ; 3—One-day after fertilization ; 4—Four-day after fertilization ; 5—Eight-day after fertilization - - - - - - - ; 11—Thirty-two-day after fertilization.

Nitrate reductase is mainly a substrate[1] (No_3^-) inducible enzyme. However, plant growth regulators[7] also mediate the enzymic activity. In the case of cotton, fertilizations proceeds the synthesis[8] of auxins, gibberellins and cytokinins, which support the development of seed as well as cellulose fibre. During the early phase of seed development, protein synthesis is intense and nitrogen to be utilized in protein formation in the seeds is unlikely to be transported as nitrate ions, but in the form of organic nitrogen as amides and amino-acids (Woodruff[9], 1972). However, a positive relationship between enzymic activity and seed weight suggests that nitrate reductase activity in the seed is, somehow, associated with the seed development in cotton.

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FUNGITOXICITY OF SOME UREA DERIVATIVES OF 1, 3, 4-THIADIAZOLE

RECENTLY some mercapto and acetoxy derivatives of 1, 3, 4-thiadiazole have been reported to possess strong antifungal activity[1,2]. This prompted the authors to undertake the investigation of urea derivatives of 1, 3, 4-thiadiazole for their fungi toxicity and to evaluate their efficacy against standard fungicides.

The fungi toxicity of the compounds and commercial fungicides was observed against *Pythium aphanidermatum* by the poisoned food technique[3]. Requisite quantities of all the compounds were dissolved in a solution of acetone and water (5 : 95) so as to give a concentration of 5,000, 10,000, 20,000, 30,000 and 40,000 μg/ml. The same concentrations were maintained for the commercial fungicides in sterilized double distilled water. One ml of the prepared solution was added to presterilized petriplates containing nine ml of sterilized Czapek's agar medium so as to make a final dose of 500, 1,000, 2,000, 3,000 and 4,000 μg/ml of the compounds or fungicides in the medium. For control nine ml of the medium was supplemented with one ml of acetone : water (5 : 95) solution. A mycelial disc of 5 mm in diameter from the periphery of a 7-day old culture of the test fungus was inoculated upside downwards to assay plates. The plates were incubated at 28° C (± 1) and observations were recorded on the seventh day. The colony diameter of the test fungus was measured in mutually perpendicular directions and % mycelial inhibition calculated. Fungi toxicity of the compounds as well as of fungicides were measured in terms of toxicity index[4]. Experiments were repeated twice and each contained five replicates.

Out of seven urea derivatives of 1, 3, 4-thiadiazole, only two exhibited maximum toxicity index indicating their strong fungi toxicity at a minimum dose of 500 μg/ml (Table I). The toxic doses of both the compounds (4 and 5 in Table I) were four times less than that of commercial fungicides, *viz.*, Dithane Z–78 and Dithane M–45 while six times less than Ziram, indicating thereby that the compounds may be utilised as a new, more potent, fungi toxic agent on commercial basis. Table I also showed that the change in the position of nitrophenyl group of both the compounds (4 and 5 in Table I) had no effect on their fungi toxicity. Further studies to determine *In vivo* efficacy of both the compounds are in progress.

TABLE I

Comparative fungi toxicity of urea derivatives of 1, 3, 4-*thiadiazole with commercial fungicides against* Pythium aphanidermatum

Sl. No.	Name of compounds and fungicides	Toxicity index	Lethal dose in μg/ml
	*Compounds**		
1.	1-[(5-Phenyl-1, 3, 4-thiadiazole-2-yl)-3-(4-methyl)] benzene sulphonyl urea	339	2000
2.	1-[5-(4′-Flurophenyl-1, 3, 4-thiadiazole-2-yl)-3-(4-methyl)] benzene sulphonyl urea	252	3000
3.	Benzyl-[5-(4′-fluorophenyl amino)1, 3, 4-thiadiazole-2-yl] sulphonyl urea	32	<4000
4.	1-[5-(3 Nitrophenyl-1, 3, 4-thiadiazole-2-yl)-3-(4′phenyl) thiazole-2-yl] urea	500	500
5.	1-[5-(4′-Nitrophenyl-1, 3, 4-thiadiazole-2-yl)-3-(4′-phenyl) thiazole-2-yl] urea	500	500
6.	1-[5-(4′-Nitrophenyl-1, 3, 4-thiadiazole-2-yl)-3-(5′methyl) thiazole-2-yl] urea	402	2000
7.	1-[5-(4′-Nitrophenyl-1, 3, 4-thiadiazole-2-yl)-3-(4′-methyl)] benzene sulphonyl urea	252	3000
	Commercial fungicides		
8.	Dithane M–45**	341	2000
9.	Dithane Z–78***	333	2000
10.	Ziram*	309	3000

* 100% active ingredient.
** 75% active ingredient.
*** 80% active ingredient.

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A CONVENIENT NEW MEDIUM FOR RAPID PREPARATIONS OF CUTICULAR REPLICAS

CUTICULAR replicas are of value in taxonomic studies where surface details of the leaf epidermis are taken into consideration. Many different substances are utilised for obtaining such replicas including the mucilage from unripe fruits of *Coccinia cordifolia* Cong. (Patel, 1968)[1]. Sinclair and Dunn (1961)[2] and Dilcher (1974)[3] list the various media that have been used by different research workers for this purpose. The author noticed that the insulating material commercially branded 'Thermocole' dissolves rapidly in xylene giving a clear viscous fluid that can successfully be employed as yet another medium for obtaining cuticular replicas quickly.

Small pieces of clean Thermocole when dropped into a vial dissolve rapidly in dry xylene at room temperature. The air bubbles that appear when the Thermocole goes into solution may be removed by heating the solution to about 50° C for a few minutes. The solution thus obtained is clear and viscous, lending itself to be applied with a camel hair brush on to the surface of the leaf whose replica is desired. The solution spreads itself evenly on the surface and within 10 to 15 minutes dries up completely forming a very thin, slightly opaque film that can easily be peeled off either by hand or with tweezers. A fully dried film is quite firm showing no elasticity and can either be mounted dry or mounted in a drop of water for examination under transmitted light. A 10% solution was found to be a satisfactory medium for obtaining thin films of replicas from glabrous leaves such as that of *Bougainvillaea glabra* Choisy (Fig. 1). Since peels

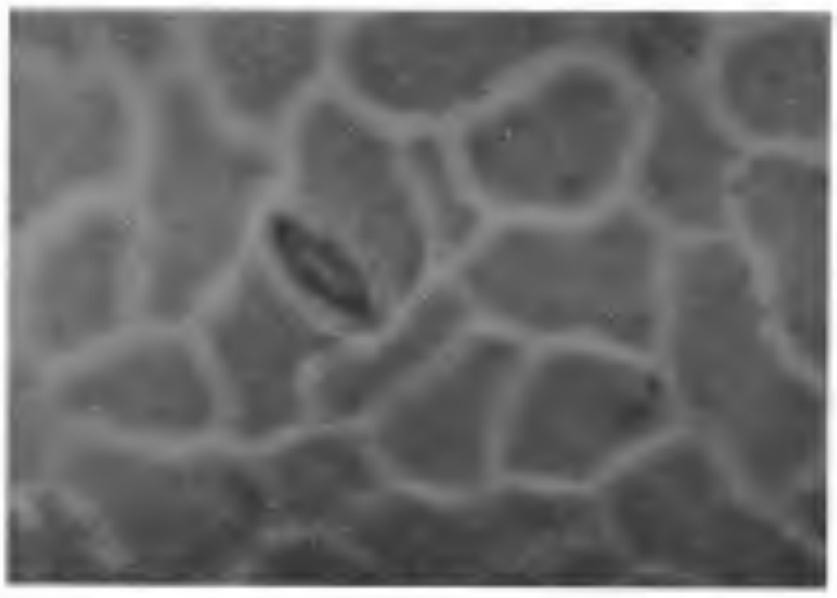

FIG. 1. Photomicrograph of the cuticular replica from the leaf of *Bougainvillaea glabra* Choisy, × 320.

of fairly large dimensions can be obtained, they may be stored in small envelopes for future use,