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A NOTE ON STEM-TIP STIFFNESS IN APHID TOLERANT COTTONS (*GOSSYPIUM HIRSUTUM* L.)

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STEM tips of cotton are the parts primarily affected by aphids (*Aphis gossypii* L.) where they multiply quickly and the incidence spreads to other parts of the plant like stem, petiole, leaf lamina, flower buds and bolls affecting the fibre quality adversely. Aphid infested seed cotton is sticky and difficult to process by ginning and obtain lint[1]. Stiffness or hardness of plant parts is one of the sensory stimuli offering mechanical resistance to insect pests[2]. Aphid resistant/tolerant cotton strains[3] were selected for testing the stiffness of stem tips for the first time in ten cotton strains in this study.

The force required to penetrate the first and second nodes of stems to different depths was determined[4] and the values recorded as force required for penetration in gram-load are presented in table 1.

The aphid susceptible cultivars LRA, Sharada and Laxmi had succulent stem tips not offering much resistance to penetration to a depth of 0.5 and 1.0 mm, while the aphid tolerant strains (JK344, MESR-17, JK276-9-1, etc.) had nearly twice stiff stem tips requiring 50 to more than 100 g force for the needle to penetrate up to 1 mm. At deeper levels of 2 mm or more, the tolerant cottons were more than 2.5 times as hard as the susceptible cultivated cottons. Hardness for piercing the probosis into the stems of tolerant strains appears to be the main cause for non-preference by aphids. The values in table show that JK cotton strains had very hard stem tips as compared to Sharada and Laxmi in particular and LRA to a large extent. The machine developed appeared to be useful for measuring the force required for penetration of mouth parts by insects into the soft tissues of plant parts. Bock[5] advocated that hardness of plant parts need to be assessed in resistance breeding. Thus, this novel method of measuring stiffness of stem, bolls and other plant parts is an easy tool in resistance breeding programme of cotton and several other crop plants.

Table 1 *Gram-load force required for penetration of stem tips of aphid tolerant vs susceptible cottons*

	Node 1						Node 2				
	Depth of penetration (mm)										
Cotton genotypes	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5
* *Aphid tolerant*											
JK344	50.4	113.3	180.6	273.0	–	–	63.0	113.4	191.1	279.3	–
MESR-17	50.4	105.0	178.5	261.5	–	–	65.1	134.4	231.4	289.8	–
JK-276-10-5	37.8	90.3	163.8	268.9	–	–	49.4	96.6	172.4	239.4	–
JK259-4	35.7	84.3	149.1	207.5	262.5	–	41.5	84.0	144.9	203.7	264.6
JK276-9-1	42.0	96.6	151.2	201.6	244.0	–	58.8	136.5	245.7	–	–
JK-260-2	29.4	63.0	107.1	161.7	214.2	285.6	65.1	92.4	218.4	298.4	–
JK-345	27.3	67.8	115.5	153.3	199.5	236.0	57.4	90.3	144.9	197.4	256.2
Aphid susceptible											
Cv. LRA-5166	25.2	52.5	80.8	136.5	203.7	256.2	34.6	70.8	124.3	203.4	209.8
Cv. Sharada	21.0	42.0	71.4	96.6	123.9	144.9	39.9	77.7	123.9	168.0	216.3
Cv. Laxmi	21.8	46.2	73.5	102.9	126.0	153.3	23.1	58.8	115.5	184.8	235.2

* Courtesy: Kadapa *et al*[3].

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NEW REPORT OF GARLIC RUST FROM PUNJAB STATE

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GARLIC (*Allium sativum* L.), an important bulb crop, was found to be severely attacked by a rust at several places in Gurdaspur city during February 1987. A rust disease, possibly due to a species different from the one being reported, was found on garlic in 1973 from Himachal Pradesh[1].

The rust-infected plants did not support the pycnial and aecial stages. However, uredinia and telia were formed in abundance, the description of which follows: **Uredinia** amphigenous (mostly hypophyllous), usually scattered, yellowish to orange, more or less roundish, often surrounded by nearly a diamond-shaped discoloured zone; urediniospores obovate to broadly elliptical (figure 1b), yellowish, 17.27–28.79 × 11.51–23.03 (av. 22.84 × 19.32) μm in diameter; wall 1.21–4.02 (av. 2.42) μm thick, hyaline, finely echinulate, with 5–10 (commonly 6–8) scattered germ pores (figure 1a). **Teleutosori** on the leaves amphigenous, mostly scattered, on the leaf sheaths sometimes confluent, long, covered by grey epidermis, tardily naked; teleutospores ellipsoid, clavate-oblong or obliquely angular in shape, rounded, truncate or pointed above (figure 2), narrowed or rounded below, 29.94–62.18 × 18.42–32.24 (av. 49.81 × 23.47) μm in size, somewhat constricted at the septum, mostly 2-celled, not borne in loculi formed by fused paraphyses. Mesospores (av. size 25.97 × 24.04 μm), 3-celled teleutospores (av. size 56.81 × 28.21 μm) (figure 2) and 4-celled teleutos-

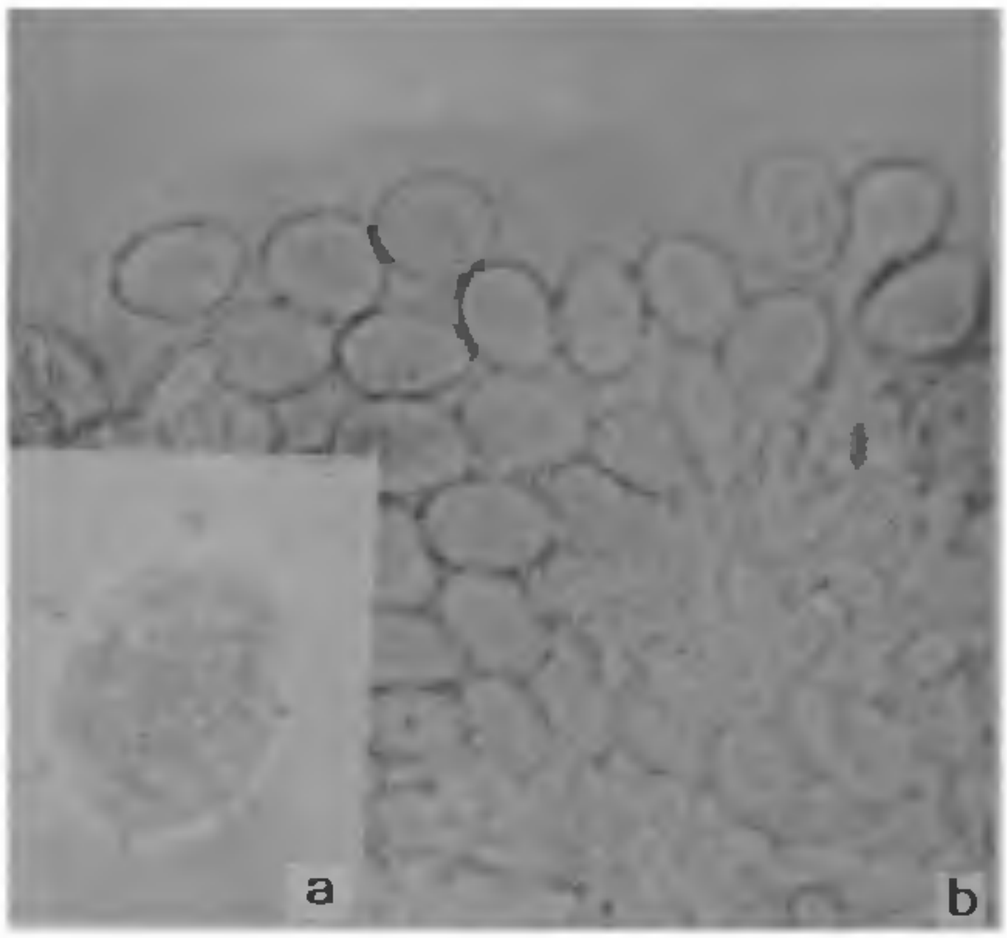

Figure 1a, b. a. Urediospore germ pores in a scattered fashion (after treatment for 48 h in 6% H_2O_2 solution). **b.** Urediospores in a section of uredinum.

pores (av. size 62.75 × 34.54 μm) rare; wall chestnut brown, 1.41–3.62 (av. 2.26) μm thick at sides, darker and 1.91–6.83 (av. 4.70) μm above, upper cell usually more densely pigmented than the lower; pedicels nearly colourless, fragile, up to 34.5 μm long.

This rust differs from the one already described undet the binomials *P. porri* (Sow.) Wint[2]. and *P. allii* (DC.) Rud.[1,3,4]. Its teleutospores are nearly one and half times longer and teleutospores wall at the apex almost twice thicker than that for the rusts reported earlier[2,4]. It departs from the rust reported

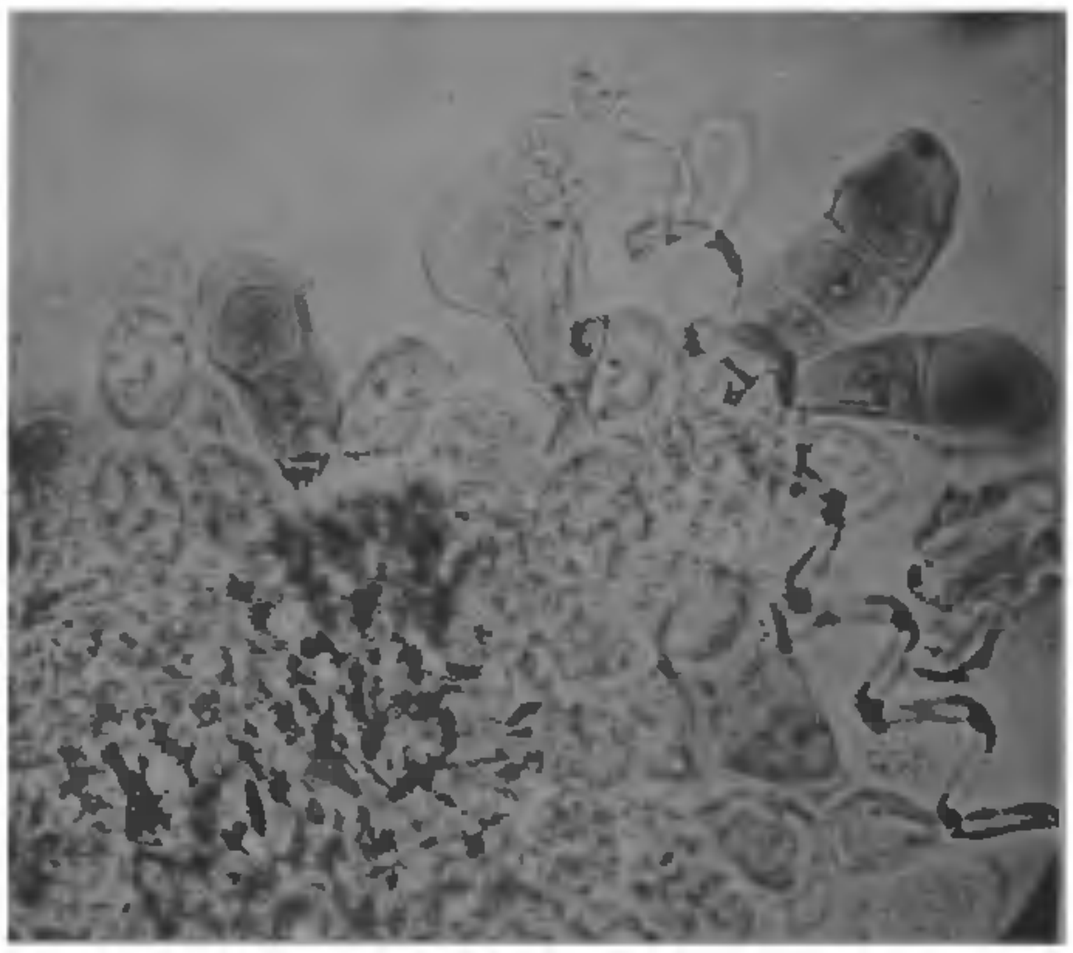

Figure 2. Two- and three-celled teleutospores among urediospores (for wall clarity treated overnight with NaOCl solution).