observed only in cultures maintained on potato dextrose agar. At 4–6°C perithecial initials were seen but these failed to mature even after 15 weeks.

Pathogenicity tests carried out with conidia from 10-day-old culture resulted in the development of typical crater-like cankers on healthy and wounded fruits after 18-20 and 10-12 days, respectively. Reisolations from induced lesions established identity with the original isolate. Diagnostic characters of the pathogen confirmed its identity as *Colletotrichum gloeosporioides* Penz. The present note makes an addition to the host index of this fungus.

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ANTAGONISTIC EFFECT OF *BACILLUS SUBTILIS* ON *FOMES DURISSIMUS*

A. B. De
Department of Botany, Burdwan Raj College, Burdwan, India

In the realm of forestry, there are very few reports of applying the antagonism phenomenon (which exists between certain micro-organisms) to the control of diseases of trees caused by fungi. Beech and oak wood blocks soaked in liquid cultures of a *Bacillus* showed retarded growth of *Lenzites* (*Daedalea*) *quercina*[1]. It has also been found that prior application of *Bacillus subtilis* inhibit canker disease caused by *Nectria galligena*[3]. In the present investigation an attempt was made to see if *B. subtilis* can check the growth of *Fomes durissimus*, a common wood-rotting polypore of India.

Polysporous culture of *Fomes durissimus* was isolated from spore deposits of a freshly collected sporophore. The bacterium was inoculated on 1·25% malt agar medium near the periphery of each Petri dish. Single fungal inoculum of 5 mm diameter was placed in each Petri dish at a considerable distance from the bacterial streak. The control plates were inoculated by fungus only. All the Petri dishes were then incubated at room temperature (28 ± 2°C) in complete darkness. The Petri dishes were checked up to eight weeks at regular intervals. The activity of the bacterium was assesed visually depending upon the extent of growth inhibition.

The growth of *Fomes durissimus* was inhibited considerably by *Bacillus subtilis* (figure 1). *B. subtilis* produces two antibiotics, mycobacillin and bacillomycin which are active against some fungi[2,3]. In the present investigation the isolation and

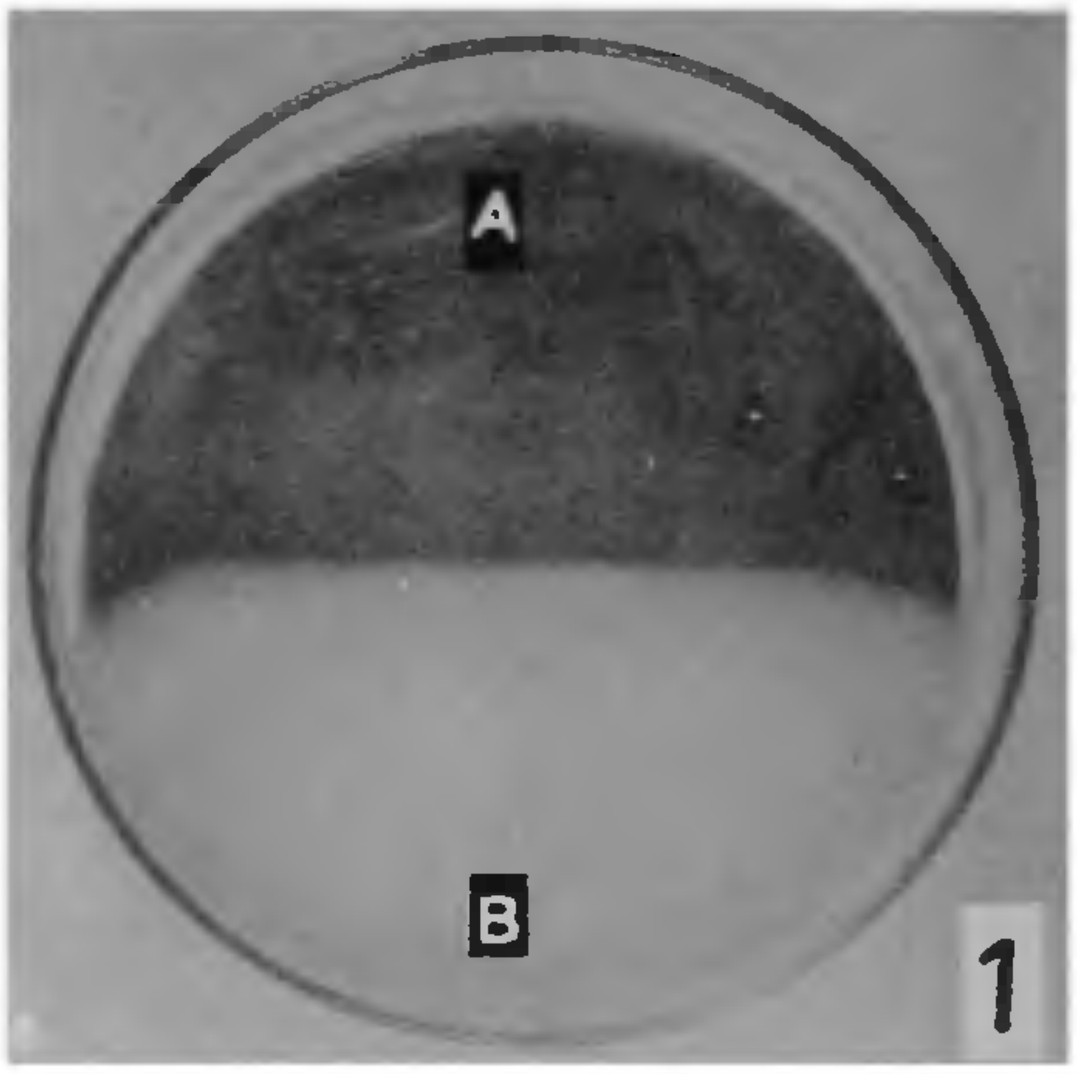

Figure 1. Antagonistic effect of *Bacillus subtilis*. **A.** On *Fomes durissimus* **B.** In Petri dish containing 1·25% malt agar medium.

characterization of the active principle of the bacterium has not been possible but the extracellular metabolites produced by *B. subtilis* caused growing hyphae of *F. durissimus* to swell and burst. The present observation therefore indicates that *B. subtilus* can be effectively used for the control of wood decay caused by *F. durissimus*.

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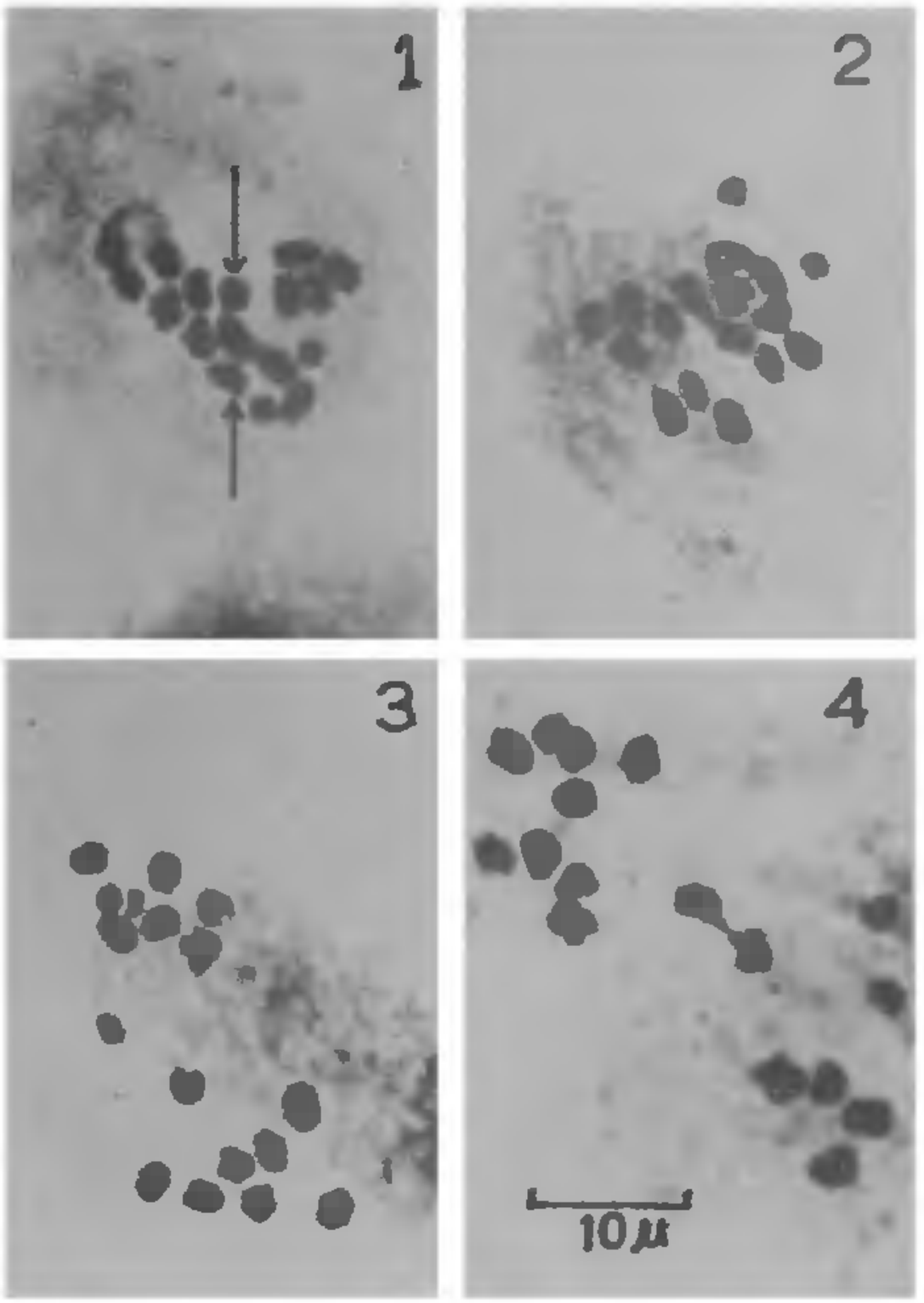
CYTOLOGICAL BEHAVIOUR OF A TETRA-TRISOMIC PLANT IN PEARL MILLET (*PENNISETUM AMERICANUM* (L.) K. SCHUM)

R. Sai Kumar, U. P. Singh, R. B. Singh* and R. M. Singh
Department of Genetics and Plant Breeding Institute of Agricultural Sciences, Banaras Hindu University, Varanasi 331 005, India
*Present address: Regional IBPGR Officer, FAO, Phra Atit Road, Bangkok (Thailand).

Addition of extra chromosomes to a complement

results in reduced plant vigour, pollen and ovule fertility. The tolerance of only two to four chromosomes has been reported in sugarbeet[1], sorghum[2], barley[3] and pearl millet[4].

Among the progeny of an open pollinated triploid plant of pearl millet, one plant out of 99 was reported to possess 17 chromosomes. As compared to double trisomic[5] this plant was highly reduced in vigour and fertility. This plant mostly formed a chain or ring of 4 chromosomes with a $III+5^{II}$ at diakinesis / MI. A high frequency of PMC's (40%) was either associated with $5^{II} + 1^{III} + 1^{IV}$ or with $2^{I} + 4^{II} + 1^{III} + 1^{IV}$ (figure 1) at diakinesis/ MI (table 1). Thus, the occurrence of a high frequency of such PMC's indicates that this plant is tetra-trisomic in nature. Simultaneously a complete absence of PMC's with 2^{III} but regular occurrence of one quadrivalent in the majority of cells (55%) excludes the possibility of its becoming as a triple trisomic. Though $2^{I} + 1^{III} + 1^{IV}$ with 4^{II} were predominant but the presence of $4^{I} + 5^{II} + 1^{III}$ or $2^{I} + 6^{II} + 1^{III}$ in certain PMC's indicates that a quadrivalent has been broken into either 4^{I} or $2^{I} + 1^{II}$ in these PMC's. Eight univalents were also observed in considerable frequency of cells (25%) which have possibly arisen after conversion of bivalents/quadrivalent into univalents at metaphase I (figure 2). The average frequency of univalents, bivalents/trivalents and quadrivalent/cell were 3·45, 4·4, 0·85 and 0·55 respectively (table 1). During chromosomes disjunction in triploid plant, all the three doses of one chromosome and two out of three doses of other member and single doses of the remaining members of the set might have moved to the same pole and formed a gamete with 10 chromosomes. On fertilization of such gametes with a normal pollen, a tetra-trisomic plant would result in the progency of triploid.



Figures 1-4. Different chromosome associations at diakinesis and metaphase I and distribution of chromosomes at anaphase I in tetra-trisomic plant of pearl millet (*Pennisetum americanum)* **1.** Diakinesis, $2^{I} + 4^{II} + 1^{III}$ (lower arrow) + 1^{IV} (upper arrow); **2** Metaphase I, $9^{I} + 2^{II} + 1^{III}$. **3.** Anaphase I, 9-8 distribution. **4.** Anaphase I, 9-2 (late disjunction)-6 distribution.

TABLE 1

Variation of chromosome configurations at metaphase I and chromosome distribution at anaphase I in tetra trisomic plant of pearl millet (Pennisetum americanum)

Metaphase I					Anaphase I distribution of chromosomes						
No. of cells	I	II	III	IV	No. of cells	9-8	9-1-7	7-2-8	9-2-6	6-11	8-1-8
8	2	4	1	1	40	20	5	5	4	3	3
8		5	1	1	Mean %	50	12·5	12·5	10·0	7·5	7·5
4	4	5	1								
4	2	6	1								
4	8	3	1								
6	3	7									
6	8	1	1	1							
Average number/ cell	3·4	4·4	0·8	0·5							

Distribution of 9-8 was the most frequent (50%) at anaphase I (figure 3) followed by 9-1-7 (12·5%), 7-2-8 (12·5%), 9-2-6 (10%), (Figure. 4), 8-1-8 (7·5%) and 6-11 (7·5%) in descending order of magnitude (table 1). This plant could not be maintained further due to complete absence of seed set observed in this case. Though Gill *et al*[1] have reported the maximum limits of tolerance of three extra chromosomes (triple trisomic) in pearl millet, the presence of one tetra-trisomic plant in this study suggests that plants with 4 doeses of one chromosome (tetrasomic) in addition to trisomic condition of other member of the set can also be viable in pearl millet.

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A NEW FRUIT ROT OF POMEGRANATE CAUSED BY *ASPERGILLUS VARIECOLOR*

R. B. SHARMA, A. N. ROY AND G. SINGH
Department of Botany, Agra College, Agra, India

A fruit rot of Pomegranate (*Punica granatum* L.) was observed during rainy season in local fruit shops. The disease was not commonly present but wherever it occurred, the extent of rotting ranged from 15–25 per cent, at times, the whole consignment was rendered unfit for consumption.

Isolation revealed the presence of *Aspergillus variecolor* (Berkeley & Broome) Thom and Raper as causative agent for the disease under study. The disease is characterised by softening of rind and underlying pulp. The affected rind initially turns brown and then blackish brown at advanced stage of infection. The fruits neither shrivel nor loose their shape until they are pressed.

The pathogenicity of *A. variecolor* was established by artificial inoculation on surface sterilized healthy pomegranate fruits, following pin pricks. Typical rot symptoms developed within a week. Control fruits remained healthy throughout.

Several Aspergilli *viz., A. awamori, A. fumigatus, A. flavus, A. niger, A. niveus, A. versicolor* and *Drechslera rostrata* have been reported earlier to cause fruit rot of *Punica granatum* L[1–4] but the disease caused by *A. variecolor* has not been reported so far.

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