Figure 1a–c. Photomicrographs of T. S. of (a) roots (×1500), (b) stem (×900) and (c) leaves (×675) of *Triticum* showing *Azotobacter chroococcum* within the cells of the tissues.

mesophyll region of leaf (figure 1c) were found to be teeming with microbodies, both single and pairs. Movement was arrested by adding 75% ethanol. Morphologically the microbes appeared coccoidal.

The presence of bacteria inside the above tissues was confirmed by placing aseptically prepared sections on nitrogen-free Norris glucose agar. At 30°C brown-pigmented bacteria appeared around leaf, stem and root sections. The colonies were raised, smooth, cream-white initially, mucoid, and on prolonged incubation formed pigment. They were capsulated, nonsporulating, aerobic, motile and gram-negative. The isolates could utilize glucose, mannitol, sucrose and starch but not rhamnose. Following Bergey's Manual[5], the isolates have been identified as a variant of *Azotobacter chroococcum*. Pure cultures obtained from the host tissue fixed nitrogen (2.9 to 3.8 mg N/g of glucose as estimated by the micro-Kjeldahl method). It remains to be investigated whether nitrogen fixation occurs at the sites where the bacteria were localized, and if so, its intensity and benefit to the host plant. These results and those of others[6,7] support the presence of *Azotobacter* in the cortical cells of the host.

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ANTIBACTERIAL ACTIVITY OF A POLYCATION

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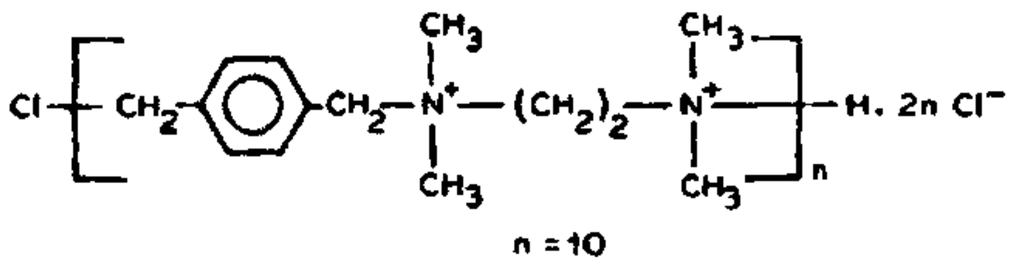
POLYCATIONS are linear and contain aromatic, aliphatic and quaternary salt units. The simpler

ionone polymers are structurally related to spermine, spermidine and their methylated derivatives[1]. Polymers containing cationic centres form very interesting polysalts, which have a variety of uses[2]. Since a polycation of high positive charge could lead to organic materials of high conductivity, this type of polymer is of considerable interest. The synthetic polycation polylysine inhibits the infectivity of tobacco mosaic virus as well as some animal viruses and bacteriophages, and the growth of numerous bacteria[3]. Polycations constitute an important group of biologically active molecules that have shown considerable promise in prophyl axis and chemotherapy of viral infections[4]. It is well known that polycations interact with nucleic acids and α-amylases[5]. This communication reports antibacterial activity of a synthetic polycation.

The polycation shown below was synthesized according to the procedure described earlier[6,7]. It was screened for activity against eight bacterial species, viz. *Escherichia coli*, *Pseudomonas alkaligenes*, *Bacillus subtilis*, *Proteus vulgaris*, *Serratia marcescens*, *Vibrio cholerae*, *Shigella sonnei* and *Salmonella typhi*. Antibacterial activity was assessed by the cup plate method[8]. The base layer medium was melted on a water bath and cooled to 55°C. Aliquots of 20 ml of liquid medium were distributed to each petri dish and allowed to solidify. The seed layer medium was melted and cooled to 45–50°C with gentle shaking. Overnight culture (2%) was added asceptically to the seed layer medium, which was then mixed thoroughly and quickly poured into petri dishes containing the base layer. After solidification and cooling, cups were made by punching into the set agar with a sterile cork borer and scooping out the punched part. The diameter of each cup was 10 mm. To these cups, 0.1 ml (9 μg) of a solution of the polycation in distilled water was added using a sterile. The plates were kept in the cold for an hour to facilitate diffusion. They were then incubated at 37°C for 48 h. Aqueous phenol (5%) was used as positive control. The results are summarized in table 1.

On the basis of these observations the polycation is highly active against *E. coli* and *P. alkaligenes*, moderately active against *S. typhi*, and less active against *P. vulgaris* and *S. marcescens*. It was inactive against the other microorganisms tested.



n = 10

Table 1 *Antibacterial activity of polycation*

Organism	Zone of inhibition (mm)
E. coli	25–32
P. alkaligenes	25–32
S. typhi	20–25
P. vulgaris	15–20
S. marcescens	15–20
V. cholerae	—
S. sonnei	—
B. subtilis	—

—, No inhibition.

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PHOSPHAMIDON-INDUCED CHANGES IN HEPATIC ENZYMES OF MOUSE

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PHOSPHAMIDON (*O,O*-dimethyl-*O*-1-methyl-2-choloro-2-diethylcarbamoylvinyl phosphate) is an organophosphate systemic acaricide. It is extensively used against sucking, chewing and mining insects. The