MICROWAVE OVEN IN MICROBIOLOGY

Pages with reference to book, From 256 To 256

Editor, In one of your recent J.P.M.A. (Jan. 92) issue an original article named “Microwave oven in microbiology laboratory” was studied in detail by me and various aspects were found very interesting and beneficial to a microbiologist. At the same time, some questions have arised in mind and I wanted answers. Please help me in this connection. My first question is how the desired sterilizing temperature (1 10°C/121°C) could be achieved in culture medium placed in an open atmosphere, i.e., microwave oven where by no means one can maintain temperature above 100°C which is insufficient to kill all forms of life. It is the moist heat that kills the micro- organisms by coagulation, denaturation and by disruption of the vital cellular constituents and not the expansion of molecules results in death. Here it is also to note H2O molecule and microbial cell cannot be compared evenly as referred in #1. Because radiowaves of 2450 MHz can only vibrate and expand the free H2O molecules present around and within the cell producing heat. Now what about the spores which have no free H2O molecules! Secondly, the culture medium under test (MacKonky’s & Blood Agar) sterilized in M.O. are already inhibitory to some extent to many bacteria due to Bile Salt/C.V. in MacKonky’s Agar and addition of blood in blood agar base. So in my opinion the results could be different if some other differential and complete medium like I.S.I. Agar & Trypticare soya broth tested for sterilization in M.O. Thirdly whether the radio wave (electro-magnetic wave) will not ionize or change the vital substances such as vitamins, sugars, A. acids of the medium making it incomplete/deficient? Fourthly how the temperature of M.O. can sharply be controlled as we do in autoclave by adjusting the steam pressure. Lastly how the other materials like latex tubes, gloves, cloths, glass/plastic containers, sugar broths, delicate medium and discards etc can be sterilized in microwave oven?
I shall be highly grateful to you for replying soon.

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