INTRODUCTION

The Hall effect known in physics, describes the ability of the magnetic energy must change the electron flow of ions from the plasma membrane (Gerber, 2000) influencing existing bioelectric a delicate balance. Through a realignment of the electron flow resulting in changes in the conformation of the molecules and can modify the rate of enzymatic processes and cause changes in that body (Heneine, 2000). Magnetic field is the space around the magnet where its magnetic power and influence can be detected and filled with lines of magnetic force (SOUZA, 2005). The action of static magnetic fields on biological systems are linked to the ability of the plasma membrane excitability and its property of diamagnetic anisotropy, to be influenced by the magnetic field, due to its modification of ion channels (DINI, ABRRR, 2005) may occur. The orientation of the spins of electrons and protons can be altered by the magnetic field, which changes your energy level, modifying biological molecules (Ikehata ET AL, 1999).

Gram negative bacteria have outer cell membrane containing LPS (lipopolysaccharide) and proteins that control the permeability of substances through their channels porin into the periplasmic space and then into the cell through the cytoplasmic membrane (VISA, 2014). Gram positive bacteria have a larger amount of its wall peptligicano, polymeric compound is thicker layer Gram negative (Pelczar, 2012). Fungi are non-photosynthetic eukaryotic organisms, food gets its absorption, lack chlorophyll and have rigid cell wall composed of chitin (Fukuda, 2009). Depending on the intensity and duration of exposure to the magnetic field, the changes may be reversible or irreversible, intra- or extracellular (Saffer; PHILLIPS, 1996). The action of the south pole behind a type of energy that accelerates the activity, increasing reaction with hydrogen. Since the action of the north pole behind a negative type of energy that slows cellular activity, decreasing the reaction with hydrogen (Gerber, 2000).

METHODOLOGY

Cultures were performed according to the criteria of safety due, according to ANVISA's manual, with monitoring of the purity of growing some bacteria and some fungi for growth assessment for colony counts (CFU). Permanent magnets with magnetic energy potency of 740 gauss, the magnets being fixed 5 out of the Petri dish were used. The north pole and the south pole were applied separately, ie, in different plates. 3 permanent magnets 4000 Gauss Power fixed the same way were also used. For standardization of microbial suspension, five colonies of micro-organism isolated in selective medium, and inoculated into 10 ml of sterile saline were captured. Regarding the bacteria by depletion after sowing surface or chocolate blood agar, the plates were incubated in aerobic bacteriological incubator 35 to 37 ° C for 48 hours. Regarding fungi, we proceeded in the same way as the type of seeding, with different incubation occurred at room temperature. The agar chosen for the seeding of fungi was Saboureau dextrose agar with chloramphenicol.

With respect to the bacteria Streptococcus pneumoniae, due to their mucoid consistency (ease of spreading on the surface of the agar), standardized bacterial suspension was held with only two colonies so that no trouble occurred in the count. This situation troubled count of CFUs was observed when added five colonies, the problem is solved when held with fewer colonies microbial suspension as explained above. The same was done with respect to Penicillium therefore spreads easily. Control cultures (microbial growth without the influence of the magnets) performed on the same type of agar and using the same methodology as the test crop, to serve for comparison in relation to the magnet attached microbial growth were made. The colony count was performed with the naked eye and with a magnifying glass if necessary, the observation is made under reflected light, counting each colony developed. For greater precision in the count, the petri dish was divided into quadrants. The microorganisms tested were: Pseudomonas aeruginosa, Proteus mirabilis, Staphylococcus aureus, coagulase negative Staphylococcus, Streptococcus pneumoniae, Candida spp and Penicillium spp.

RESULTS:

Proteus mirabilis (Plate control = 3,624 CFU)

740 Gauss North Pole: 3036 CFU
4000 Gauss North Pole: 2646 CFU
740 Gauss South Pole: 5066 CFU
4000 Gauss South Pole: 3,800 CFU

Pseudomonas aeruginosa (Plate Control: 1800 CFU)

740 Gauss North Pole: 2185 CFU
4000 Gauss North Pole: 3780 CFU
740 Gauss South Pole: 2430 CFU
4000 Gauss South Pole: 2450 CFU

Streptococcus pneumoniae (Plate control = 2,627 CFU)

740 Gauss North Pole: 5560 CFU
4000 Gauss North Pole: 61 CFU
740 Gauss South Pole: 4203 CFU
4000 Gauss South Pole: 3110 CFU

Staphylococcus aureus (Plate control = 7,810 CFU)

740 Gauss North Pole: 4810 CFU
4000 Gauss North Pole 2340 CFU
740 Gauss South Pole: 1530 CFU
4000 Gauss South Pole: 3370 CFU
Coagulase negative Staphylococcus (Plate Control = 12,000 CFU) test:
740 Gauss North Pole 6980 CFU
4000 Gauss North Pole 4930 CFU
South Pole 740 Gauss 14,000 CFU
Gauss 4000 South Pole 5780 CFU

Candida spp (control = 310= CFU) test:
740 Gauss North Pole 635 CFU
4000 Gauss North Pole 122 CFU
740 Gauss South Pole 105 CFU
4000 Gauss South Pole 198 CFU

Penicillium spp (control = 431 UFC) test:
740 Gauss North Pole: 604 CFU
4000 Gauss North Pole: 427 CFU
740 Gauss South Pole: 770 CFU
4000 Gauss South Pole: 510 CFU

Graphs in percentage growth:

Graph 1 - Proteus spp.
Regarding the control board 100% with the north pole 740 G inhibited 16.23%. The South pole stimulated with 740 G at 39.81% and South pole stimulated with 4000 G in 4.85% growth.

Graph 2 - Pseudomonas aeruginosa
Regarding the control board 100% in both the North Pole and the South Pole showed stimulatory effect on microbial growth with the following percentages: 740 North G: 21.39% North 4000 G: 110%, 740 South G: 35% and 4000 South G: 36.1%

Graph 3 - Streptococcus pneumoniae.
Regarding the control board 100% with the North Pole 4000 G showed inhibitory effect of 97.3%. And indeed the North Pole with stimulatory G 740 showed 111%, with 740 G South Pole: 59.9% and South Pole at 4000 G: 18.4%.

Graph 4 - Staphylococcus aureus.
Regarding the control board 100%, all the poles showed inhibitory effect. The North Pole: 61.6%, South Pole with 740 G: 80.4%, North Pole 4000 G: 70.1% and the South Pole at 4000 G: 56.8% inhibition to the growth of Staphylococcus aureus.

Graph 5 - Staphylococcus coagulase negative.

Regarding the control board 100%, with the South Pole 740 G showed a 17% stimulatory effect and the other poles showed inhibitory effect, and the North Pole with 740 G: 41.83% North Pole with 4,000 G: 59% and the South Pole with G 4000: 52.9%.

Graph 6 - Candida spp

Regarding the control board 100% with the north pole 740 G showed stimulatory effect of 104.9%, and the remaining poles showed inhibitory effect, and South Pole with 740 G: 66.1%, North pole with 4.000 G: 60, 6% and the South Pole at 4000 G: 36.1% inhibition of growth.

Graph 7 - Penicilliumspp

Regarding the control board 100% with the North Pole 4000 G showed inhibitory effect of 60.6% and the remaining poles showed stimulatory effect on growth, with North pole 740 G: 40.1%, 740 South G polo: 78% and the South Pole with G 4000: 18.3%.

CONCLUSION
The magnetic field showed influence on microbial growth, both the stimulus and by inhibiting the growth of microorganisms tested. Several areas have been using the magnetic field, even as therapy in the repair of bone fractures, acute pain and in industry. These influences caused by the magnetic field indicate that further studies be conducted, as this present work is being continued, performing new tests with other micro-organisms. Such information being widely studied may have future applicability in several important areas, such as infectious diseases or preserving food for example.

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REFERENCES
DINI, L.; ABRO, L., moderate intensity bioeffects of static magnetic fields on cell cultures, Micron, 36, 2005.
PANAGAPoulos, DL, et al. The mechanism of action is oscillating electric fields on cells, Biochemical and Biophysical Research Communications, 272, 2000.
ACTION OF MAGNETISM ON GROWTH OF SOME BACTERIA AND SOME FUNGI

Abstract

The flow of ions from the plasma membrane of fungi and bacteria have bioelectric a delicate balance. The magnetic energy is able to influence that flow through the Hall effect, creating changes in the conformation of the protein molecules and enzymes. Can alter the rate of enzymatic processes (HENEINE, 2000), the speed of the sodium-potassium pump, the calcium pumps (GRISSON, 1995) which carry out control over the osmotic ions inside and outside the membrane, including control inlet and outlet water (PAPAGAPOULOS, ET AL, 2000). The stimulation or inhibition of cellular processes performed by magnetic fields are of great interest for cell biology, microbiology and biotechnology industry for its significant potential applications. This paper aims to ascertain whether the magnetic north pole and south power pole causing stimulation or inhibition in the growth of some bacteria and fungi. This study was developed by culturing some bacteria and some fungi developed in appropriate culture media and incubation with control colonies and colonies tests. In tests, the magnets of 740 gauss and 4000 gauss north pole to south pole and set the dish containing the sowing of standardized microbial suspension were used. Control samples not magnets were added.

Keywords: Magnetism, plasma membrane microbial growth.