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The Search for Life on Mars: A Review of Current Evidence, Health Aspects, Precautions, Treatments and Future Prospects

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Abstract:- Mars is one of the most studied and speculated planets in our solar system for years, whether it contains life or not. Previously, several missions have been sent to explore the red planet, and while there is still no definitive proof of life on Mars, the possibility remains. This aims to explore the potential health aspects of life on Mars, preventive measures that must be taken and the treatment that may be necessary in case of exposure to Mars microorganisms. The search for life beyond Earth has long fascinated scientists and the public. Of all the planets in our solar system, Mars has emerged as the most promising host candidate for microbial life. This provides an overview of the current evidence for the presence of life on Mars, including recent discoveries of organic molecules and evidence of liquid water. It also discusses challenges and opportunities facing future missions to Mars, including the search for biological signatures and the need for sample return missions.

Keywords:- *Mars, Life Possibility, Medical Requirements*

I. INTRODUCTION

The search for life on Mars has captured the imagination of scientists and the public alike for decades. The red planet, Mars, has been a primary target of exploration for decades and a few missions were sent to study its environment, geology and potential for life. While the idea of Martians may have originated in science fiction, recent discoveries have provided exciting evidence that microbial life may actually exist on the red planet. Searching for life on Mars is a complex and multidisciplinary endeavor that requires the collaboration of scientists and scientists engineers from many different fields. In this the current evidence for the existence of life on Mars and the challenges and opportunities that future missions to the planet will face. While so far there is no concrete evidence of life on Mars, recent discoveries of water and organic molecules renewed interest in the possibility of finding Martian life. However, if life is found on Mars, it is important to consider the potential health risks associated with exposure to Martian microorganisms and measures to be taken to protect human health.

II. SURFACE

The Red Planet has many colors. The reason why Mars looks reddish is due to oxidation or iron rusting in rocks, regolith (Martian soil) and Martian dust. This dust is trapped in the atmosphere and makes the planet appear predominantly red from a distance. Interestingly, while Mars is roughly half the diameter of Earth, its surface has nearly the same arealike the dry land of the Earth.

- Land area on Earth: 148.9 million km2
- Land surface on Mars: 144.8 million km2

III. SOME OF THE MAIN DIFFICULTIES IN LIVING ON MARS INCLUDE

- **Direct Sunlight:** Direct sunlight or direct UV disturbance on the planet causes serious problems such as burning skin, also unable to grow food in the open space for which people will have to wear a space suit if they travel to mars and they would have to create an artificial atmosphere for growing food.
- **Only Traces of O2**: Mars only has 0.16% O2, making it a huge problem for survival humans because it is a necessity for humans to survive.
- **Perchlorate:** Perchlorate is a highly reactive substance present in the soil of Mars. Human exposure to high doses of perchlorate may interfere with thyroid uptake of iodide gland, which disrupts thyroid function and potentially leads to a decrease in thyroid hormone production.
- **Microgravity**: The low gravity of Mars can be reduced by daily physical activity basis. It will reduce the negative effects of low gravity.
- **Mars Radiation:** Cancer risk predicted to be only 10% in the long run, but combined with low gravity, the risks may increase considerably.

Mars Colonist will inevitably bring particles of Martian dust to bases and could breathe or swallow even without noticing. Perchlorate found in the Martian soil is highly toxic compound and even a small amount of these substances would stop the thyroid gland from functioning, raise BP to dangerous levels or cause lung lesions.

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IV. EVIDENCE FOR LIFE ON MARS

The search for life on Mars has been going on for decades and there are many missions sent to explore the planet's surface and atmosphere. One of the most significant finds in recent years was the discovery of organic molecules in Martian rocks by the Curiosity rover. These molecules, which include complex hydrocarbons, suggest that Mars may once have been sheltered by life or that it can be like that even today. Another most important discovery was the detection of liquid water on the surface of Mars. The presence of liquid water is a key ingredient for life as we know it, and its discovery has increased hopes that microbial life may exist in underground aquifers or other hidden places on the planet.

V. SUPPORT FOR LIFE ON MARS

- **Abundant Minerals Present on Mars:** Minerals are essential for the human body, cultivation and production of food and other requirements. The mineral resources are known to be abundant on Mars. Resources on Mars include nickel, titanium, iron, aluminum, sulphur, chlorine and calcium. The most common compound measured by the Viking Lander on Mars was silicon dioxide, which is the basic component of glass which ensures sufficient minerals and excellent materials for an excellent type of construction. The Viking program in the 1970s was the first to return data that currently has no evidence of life on Mars.
- **Food production on Mars:** Advances in robotic technology may help us in food production, and cultivation on the red planet. By using the sunlight in a protected atmosphere environment or with an artificial light source, robotic agriculture can work and enable human survival possible on mars. NASA Science and technical information (STI) papers suggest that so far “possible food sources” that could be among those produced on the planet are fungi, insects, cyanobacteria such as spirulina and duckweed along with many others. This means we could have more sources of nutrition to eat Mars.
- **Artificial preparation of O2:** O2 can be prepared from CO2 by breaking the CO2 molecule into CO a A. A facility called the Mars Oxygen Resource Utilization Experiment extracted CO2 from Mars. The atmosphere produced O2 and it succeeded.
- **Challenges and Opportunities:** While the discovery of organic molecules and liquid water is exciting, the search for life on Mars is far from over. One of the biggest challenges of future missions is the search for biological signatures - evidence that would definitively prove the existence of life on the planet. This could include detection of specific molecules, isotope patterns, and the like signs of biological activity. Another challenge is the need for sample return missions. While robotic missions can provide valuable data, only a sample return mission can provide the level details needed to conclusively identify biological signatures. Such a mission would require significant technological progress and a high degree of international cooperation.
- **Health aspects of life on Mars:** If life exists on Mars, it is likely to be microbial in nature. bacteria, archaea or other unicellular organisms. While some microorganisms are harmless or even beneficial to human health, others can cause diseases. In addition, Martian microorganisms may have different biochemical processes and genetic makeup than those found on Earth which may pose a risk to human health.
- **Precautions:** To protect human health from potential Martian microorganisms, yes important to take certain measures. One of the most important precautions is to ensure that any spacecraft or device sent to Mars is thoroughly sterilized before launch. This minimizes the risk of contamination of the Martian environment by terrestrial microorganisms, as well as the risk of contamination of Earth by Martian microorganisms after return of astronauts or samples. In addition, astronauts exploring Mars will have to wear protective suits and follow strict protocols for handling any potential samples or specimens.
- **Treatment:** If an astronaut is exposed to Martian microorganisms and becomes ill, it is important to have effective treatment in place. However, given the potential differences between the Martian and For terrestrial microorganisms, it is possible that standard treatment will not be effective. That's why it is essential for the research and development of new treatments specially adapted to Martian microorganisms.

VI. CONCLUSION

The search for life on Mars is one of the most exciting and important scientific discoveries of our time. Recent discoveries of organic molecules and liquid water have raised hopes that microbial life may exist on the planet, but the search for definitive evidence of life is far from over. Future missions to Mars will face significant challenges, but they will also present tremendous opportunities for scientific discovery and international collaboration. While exploring life on Mars would be a breakthrough for science, it's important to consider the potential health risks associated with exposure to Martian microorganisms. By taking the necessary measures and developing effective treatments, we can ensure the safety and health of research astronauts on Mars, as well as protecting Earth from potential contamination.

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