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## Probability inspection using solution and ozone gas for lichen removal in historical levels for case study of Persepolice pilot

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Lichens consists of algae and mushroom coexistence but it is believed that parasitic life of mushroom on algae in the way that mushroom feed from mineral and organic materials of stone. As a result of *lichens* interactions, stone breaks and convert to soil. Some lichen grow out only 1 mm during one year and this coexistent mushroom live for 4000 years and could resist in -60 oC. There is lichen hazard in all historical buildings but most risk is in stone inscription in Fars province that is observed in stone inscription in Persepolice. Many methods are proposed but are not practical in historical works and results in damages such as mechanical methods or washing by water with high pressure or by biocide which are expensive. In present study feasibility of ozone is tested and main question is that by what dose and density of ozone solution or gas. Lichen could be diminished and also what is destructive effect of ozone on stone and whether it could result in color changes. What is its effect on utilized bacteria in lichens and its effects on algae chlorophyll? Some advantages of ozone in comparison with other methods is it is more safe and low-cost also its high oxidation because of its ozone structure that include oxygen which affect on microorganism cellular wall very much. Research importance could be inspected from several perspectives, first regarding to stone and historical building variety in country and lichen in these works especially in Persepolice and present inscription importance in Persepolice and high cost of these buildings destruction for country. Persepolice inscriptions penetrate some millimeter in stone and in some places these lichens could be observed in these inscriptions. Lichens could penetrate in stone because of their thallus structure thus it is possible that inscription drawing mechanical methods for these inscriptions and drawings is disastrous because it is absorbed that by brushing, thallus would scatter and would grow out more. Applying laser and water have its disadvantages and exhibit stone erosion thus applying ozone gas and solution in water could have minimum disadvantage and hazard.

### Biography

Hossein Naderi has completed his college degree in Veterinary from Islamic Azad University of Garmsar and BSc in Librarian studies from Allameh Tabatabaib University and Master's degree in Bio-conservation at Islamic Azad University of Tehran Markaz. He is the Director of Power Research Institution as Archivist. He has also studied Homeopathy Medicine.

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