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Synergistic Effect of Cement and Mucilage of *Optuntia ficus indica* Cladodes on the Strength Properties of Lateritic Soil

[Busari Ayobami](#); [Akinmusuru Joseph](#); [Ogunro Vincent](#); and [Ofuyatan Olutokunbo](#)

Abstract

In a bid to reduce the cost of pavement construction and the environmental impact of using cement as a conventional stabilizer, there is a need for a green alternative. The use of mucilage of *Optuntia ficus indica* cladodes (MOFIC) which contains several amino acids and sugars was used in improving the strength properties of cement stabilized lateritic soil. The parameters tested were atterberg limits, compaction characteristics (optimum moisture content and maximum dry density), California bearing ratio (CBR) and the UCS. The addition of (cement + MOFIC) to the cement stabilized sample reduced the plasticity index which improved from a subgrade to a subbase material. Furthermore, the CBR value of 76 and

58% was obtained for the addition of (cement + MOFIC) for both the soaked and unsoaked samples. The unconfined compressive strength (UCS) improved from 140 to 720 kN/m² as a result of the connectivity of the polysaccharide component in the pectin of the mucilage. In a bid to reduce the cost of cement as a conventional stabilizer and espouse green construction, the use of (cement + MOFIC) is a sustainable and cost effective alternative in improving the strength properties of pavement interlayer

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