

# Past Investigations on Chemical and Mechanical Properties of Scallion (Spring Onion Leafs)

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**Abstract:** *The use of Scallion (onion leaf) in cementitious materials can contribute to the improvement of technological properties and environmental issues related to the reuse of agro-industrial waste. In our country Onion production is approximately 31.12 million tons per year, generating large environmental impacts, because the disposal in landfills. The objective of this research was to evaluate the potential of reusing the Scallion as Binding element in eco- friendly mortar for the purpose of recovering building structures committed to coastal environments, in addition to avoiding the disposal of this waste in landfills. The Scallion were characterized physically, morphologically and chemically, in the treated and untreated (natural) condition, for further technological evaluation of mortars in the fresh state, such as consistency, specific mass, incorporated air and water retention. Comprehensive studies of the hardened state were also carried out to study mechanical strength (compressive and tensile), water absorption due to capillarity and immersion, sorptivity as well as durability by evaluating mass loss and mechanical strength after exposure conditions. The results showed that the Scallion treatment process improved its characteristics for application in mortar with addition of 0.25%, 0.5%, 0.75%, 2.5%, 5%, 7.5%, 10%, 15% in cement mass, causing the better in the technological and durability properties, and a proposed new means of disposing of agro-industrial waste, contributing to a circular economy.*

**Keywords:** Scallion

## REFERENCES

- [1]. QUDSIYA ZAHERA HAIDRY, Performance of Controlled Low Strength Materials Using Onion Peel Ash. May 2022, ISSN 23496002.
- [2]. Mareike Thiedeitz, Benjamin Ostermaier, Thomas Krankel "Rice husk ash as an additive in mortar Contribution to microstructural, strength and durability performance" 2022 10.6 Volume 184, September 2022, 106389
- [3]. Afonso R. Azevedo, Thuany Lima, Raphael H.M. Reis, Michelle S. Oliver, Verónica S. Candido, Sergio N. Monteiro "Guaruman fiber A promising reinforcement for cement-based mortars" Volume 16, June 2022
- [4]. Kirupairaja Thanushana & Navaratnarajah Sathiparan "Mechanical performance and durability of banana fibre and coconut coir reinforced cement stabilized soil blocks" Volume 21, March 2022, 101309
- [5]. Jawad Ahmad & Zhiguang Zhou "Mechanical Properties of Natural as well as Synthetic Fiber Reinforced Concrete A Review" Volume 333, 23 May 2022, 127353
- [6]. Sasha Rai Pharitha N. Kavya D.V. Sujatha Unnikrishnan Chandrashekar "Mechanical strength and water penetration depth of palmyra fibre reinforced concrete" 20 May 2022
- [7]. Valeria Laverde, Angie Marin, Jose M Benjumes, Mauricio Rincon Ortiz- "Use of vegetable fibres as reinforcements in cement-matrix composite materials: A Review - 1 May 2022, Volume 340, 18 July 2022. 127729
- [8]. Chandrashekar S. Malalli, BR Ramji "Mechanical characterization of natural fibre reinforced polymer composites and their application in prosthesis A Review"-22 April 2022

- [9]. Xun Gao, Deju Zhu Shutong, MdZillur Rahman, Shuaicheng Feng Chen - "Structural and Mechanical Properties of Bamboo Fibre/Bundle reinforced Composites: a review"-11 May 2022. Volume 19, July-August 2022, Pages 1162-1190.
- [10]. Ray GovindChandrasekaran, G Ramakrishna, "Experimental investigation on mechanical properties of economical local natural fibre reinforced cement mortar", (2021), Volume 46, Part 17, 2021, Pages 7633-7638
- [11]. R. Borinaga-Trevino, A. Orbe, J. Canales, J. Norambuena-Contreras, "Thermal and mechanical properties of mortars reinforced with recycled brass fibres", (2020-2021), Volume 284, 17 May 2021, 122832
- [12]. BojanPoletanovic, Ivan Janotka, Marian Janck, Michal Bacuveik, IldikoMerta, "Influence of the NaOH-treated hemp fibres on the properties of fly-ash based alkali-activated mortars prior and after wet/dry cycles", (2021), Volume 309, 21 November 2021, 125072
- [13]. R.SathiaR.Vijayalakshmi - "Fresh and mechanical property of caryota- urensfibre reinforced flowable concrete"-28 September 2021 Volume 15, November-December 2021. Pages 3647-3662.
- [14]. Markos TsegayeBeyene, Michael El Kadi, TameneAdugnaDemissie, Donny Van Hemelrijck, Tine Tysmans "Mechanical behavior of cement composites reinforced by aligned Enset Fibres"-15 August 2021 Volume
- [15]. Sandra Juardin, Ivica Boko, IvankaNetingerGrubesa. Drazan Jozic, SilvijaMrakovcic - "Influence of Different treatment and amunt of spanishbroomand hemp fibres on the mechanical properties od reinforced cemant mortars " -12 November 2020. Volume 273, 1March 2021, 121702.