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## Cannabis sativa (Cannabaceae) in ancient clay plaster of Ellora Caves, India (Article)

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### Abstract

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The present research trend is to explore sustainable construction materials having least environmental impact that also encapsulate in terms of our natural resources. The present communication discusses the use of raw hemp as an organic additive in the clay plaster of the 6th century AD Buddhist Caves of Ellora, a World Heritage Site. Cannabis sativa L. admixed in the clay plaster has been identified using scanning electron microscope, Fourier transform infrared spectroscopy and stereomicroscopic studies and the results are compared with fresh specimens. The study indicates that many valuable properties of hemp were known to the ancient Indians in the 6th century AD.

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1 Schultes, R.E., Klein, W.M., Plowman, T., Lockwood, T.E.  
Cannabis: an example of taxonomic neglect  
(1974) *Bot. Mus. Leaflet, Harv. Univ*, 23, pp. 337-367. Cited 66 times.

2 Merlin, M.D.  
Archaeological Evidence for the Tradition of Psychoactive Plant Use in the Old World  
(2003) *Economic Botany*, 57 (3), pp. 295-323. Cited 83 times.  
<http://www.springerlink.com/content/120950/>  
doi: 10.1663/0013-0001(2003)057[0295:AEFTTO]2.0.CO;2

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Singh, M. , Vinodh Kumar, S.  
(2018) *Studies in Conservation*

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Singh, M. , Mamanian, D. , Shinde, V.  
(2018) *Indian Journal of Traditional Knowledge*

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3 (2008) *Hemp lime technology*  
[www.americanlimetechnology.com](http://www.americanlimetechnology.com)

allele frequencies for 69 Cannabis accessions

Hillig, K.W.  
(2005) *Journal of Industrial Hemp*

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4 Abel, E.L.  
(1980) *Marijuana: The First Twelve Thousand Years*. Cited 134 times.  
Plenum Press, New York

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5 Fleming, M.P., Clarke, R.C.  
Physical evidence for the antiquity of *Cannabis sativa* L  
(1998) *J. Int. Hemp Assoc*, 5, pp. 80-92. Cited 31 times.

6 Jiang, H.-E., Li, X., Zhao, Y.-X., Ferguson, D.K., Hueber, F., Bera, S., Wang, Y.-F., (...), Li, C.-S.  
A new insight into *Cannabis sativa* (Cannabaceae) utilization from 2500-year-old Yanghai Tombs, Xinjiang, China

(2006) *Journal of Ethnopharmacology*, 108 (3), pp. 414-422. Cited 65 times.  
doi: 10.1016/j.jep.2006.05.034

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7 Kajale, M.D.  
Archaeology and domestication of crops in the Indian subcontinent  
(1996) *Diversity*, 12 (3), pp. 23-34. Cited 2 times.

8 Bouquet, R.J.  
*Cannabis*  
(1950) *Bull. Narc*, 2, pp. 14-30. Cited 25 times.

9 Schultes, R.E.  
Random thoughts and queries on the botany of *Cannabis*  
(1970) *The Botany and Chemistry of Cannabis*, pp. 11-38. Cited 37 times.  
(eds Joyce, C. R. B. and Curry, S. H.), J. and A. Churchill Publishers, London

10 Dai, D., Jan, M.  
Characteristic and performance of elementary hemp fiber  
(2010) *Mater. Sci. Appl*, 1 (6), pp. 336-342. Cited 46 times.

11 Brett, C., Waldron, K.  
(1996) *Physiology and Biochemistry of Plant Cell Walls*. Cited 551 times.  
Chapman and Hall, London, 2nd edn

12 Sankari, H.S.  
Comparison of bast fibre yield and mechanical fibre properties of hemp (*Cannabis sativa* L.) cultivars

(2000) *Industrial Crops and Products*, 11 (1), pp. 73-84. Cited 58 times.  
doi: 10.1016/S0926-6690(99)00038-2

[View at Publisher](#)

- 13 de Bruijn, P.B.  
(2008) *Hemp concretes-mechanical properties using both shives and fibres*. Cited 4 times.

Licentiate thesis. Swedish University of Agricultural Sciences, Alnarp

---

- 14 Awwad, E., Mabsout, M., Hamad, B., Khatib, H.  
Preliminary studies on the use of natural fibers in sustainable concrete  
(2011) *Leban. Sci. J*, 12 (1), pp. 109-117. Cited 15 times.

- 15 Awwad, E., Mabsout, M., Hamad, B., Farran, M.T., Khatib, H.  
**Studies on fiber-reinforced concrete using industrial hemp fibers**

(2012) *Construction and Building Materials*, 35, pp. 710-717. Cited 30 times.  
doi: 10.1016/j.conbuildmat.2012.04.119

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---

- 16 Sedlbauer, K.  
**Frost damage of masonry walls - A hygrothermal analysis by computer simulations**

(2000) *Journal of Thermal Envelope and Building Science*, 23 (JAN.), pp. 277-281. Cited 4 times.

[View at Publisher](#)

---

- 17 Pacheco-Torgal, F., Jalali, S.  
**Cementitious building materials reinforced with vegetable fibres: A review**

(2011) *Construction and Building Materials*, 25 (2), pp. 575-581. Cited 158 times.  
doi: 10.1016/j.conbuildmat.2010.07.024

[View at Publisher](#)

---

- 18 Anderson, L.C.  
A study on systematic wood anatomy in Cannabis  
(1974) *Bot. Mus. Leaflet, Harv. Univ*, 24, pp. 29-36. Cited 17 times.

- 19 Anderson, L.C.  
Leaf variation among Cannabis species from a controlled garden  
(1980) *Bot. Mus. Leaflet, Harv. Univ*, 28, pp. 61-69. Cited 22 times.

- 20 Emboden, W.A.  
**Cannabis - a polytypic genus**  
  
(1974) *Economic Botany*, 28 (3), pp. 304-310. Cited 24 times.  
doi: 10.1007/BF02861427

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---

- 21 Hillig, K.W.  
**A chemotaxonomic analysis of terpenoid variation in Cannabis**  
  
(2004) *Biochemical Systematics and Ecology*, 32 (10), pp. 875-891. Cited 55 times.  
doi: 10.1016/j.bse.2004.04.004

[View at Publisher](#)

---

- 22 Hillig, K.W., Mahlberg, P.G.  
A chemotaxonomic analysis of cannabinoid variation in Cannabis (Cannabaceae)  
(2004) *American Journal of Botany*, 91 (6), pp. 966-975. Cited 114 times.  
<http://www.amjbot.org/cgi/reprint/91/6/966.pdf>  
doi: 10.3732/ajb.91.6.966  
View at Publisher
- 
- 23 Miller, N.G.  
The genera of Cannabaceae in the southeastern United States  
(1970) *J. Arnold Arbor., Harv. Univ*, 51, pp. 185-203. Cited 10 times.
- 
- 24 Davidyan, G.G.  
Botanicheskaya kharakteristika konopli  
(1972) *Tr. Prikl. Bot., Genet. Sel*, 48, pp. 17-52.
- 
- 25 Small, E., Cronquist, A.A.  
Practical and natural taxonomy for Cannabis  
(1976) *Taxon*, 25, pp. 405-435. Cited 104 times.
- 
- 26 Klimko, M.  
Morphological variability of Cannabis sativa L  
(1980) *Bull. Amis Sci. Lett. Poznan. Ser. D*, 20, pp. 127-134.
- 
- 27 Rhydwen, R., Wright, M., Miskin, N., Flower, A., Butler, A.  
Dry-lining versus a hemp and lime insulating render for internal thermal renovation of a stone cottage in West Wales, including embodied energy assessment, interstitial wall monitoring, in-situ U-value and WUFI modelling  
(2012) *In Retrofit 2012 Academic Conference*. Cited 2 times.  
Salford University, UK
- 
- 28 Morgan, J., Rhydwen, R., Wijeyesekera, D.C.  
An investigation into structural capabilities and suitability for mainstream construction of hemp and clay lightweight blocks  
(2012) *In Advances in Computing and Technology: 7th Annual Conference*  
University of East London
- 
- 29 Sadler, C.H., Rhydwen, R., Wijeyesekera, D.C.  
An investigation of the acute hygric properties of hemp and binder  
(2012) *In Advances in Computing and Technology: 7th Annual Conference*  
University of East London
- 
- 30 Singh, M., Arbad, B.R.  
Characterization of traditional mud mortar of the decorated wall surfaces of Ellora caves  
(2014) *Construction and Building Materials*, 65, pp. 384-395. Cited 9 times.  
doi: 10.1016/j.conbuildmat.2014.04.126  
View at Publisher
- 
- 31 (1998) *Industrial hemp, Global operations, local implications*. Cited 2 times.  
[www.Uky.edu/classes/GEN/101/Hemp/HEMP98.PDF](http://www.Uky.edu/classes/GEN/101/Hemp/HEMP98.PDF)

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