

BIO-DATA

1. Name in full (in block letter): **ANIL KUMAR POKHARIA**
2. Father's Name: Sh. Shoban Singh Pokharia
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4. Present position: **SCIENTIST-F**
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8. Date of Birth: **December 24, 1969**
9. Place of Birth:
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10. Do you belong to the Scheduled Caste/Scheduled Tribe or OBC: **No**
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**Vishakha-405, Sunrise Apartment, Sector-P, LDA Colony, Kanpur Road,
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12. Educational Qualification indicating chronologically the examinations passed from Bachelor's onwards:



Degree	Board/University	Year of Passing	Division/Class/Grade	Subject/s
B.Sc.	Delhi University	1990	II	Botany, Zoology, Chemistry
M.Sc.	Lucknow University	1992	I	Botany
Ph. D	Lucknow University	1998	Awarded	Botany (Palaeoethnobotany)

13. List of the following:

I) Details of awards/recognition/honours/fellowships of prestigious academics

- i) Visiting Scholar, Research Institute for Humanity and Nature, Kyoto, Japan (1 July -30 September, 2010)
- ii) **Nominated-Member, Internal Research Advisory Committee, National Research and Laboratory for Conservation of Cultural Property (NRLC), Lucknow, Govt. of India, Ministry of Culture (2019)**
- iii) **Nominated-Member, Board of Studies for Department of Science in Archaeology, Archaeological Survey of India (ASI), New Delhi (2019)**
- iv) Nominated-Member, Executive Committee, Indian Society for Prehistoric and Quaternary Studies, Pune
- v) Nominated-Member, Executive Committee, The Palaeobotanical Society, Lucknow, U.P.
- vi) Paper of the Month Award-March 2019

II) List of Memberships of Professional Bodies

- i) Life Member, Indian Society for Prehistoric and Quaternary Studies, Pune
- ii) Life Member, The Palaeobotanical Society, Lucknow, U.P.

III) List of Patents awarded/granted: NIL

IV) List of Publications/Books, Citations received till the date of application, h-index etc.

Citations	2085
h-index	26
i10-index	42

I) Papers published in National/International Journals

1. Yadav, R., Srivastava, A., Srivastava, R., Yadav, D., Bikkina S., Swaroop, M., **Pokharia, Anil K., (2026)**. Radiocarbon dated floral evidence from Mauryan Empire at Ajatshatru- ka- Quilla Maidan, Rajgir, Nalanda, India. *Radiocarbon* (In production). **(IF: 1.5)**.
2. Sharma, S., Zhang Y., Gao Yu., Huang Y., **Pokharia Anil K.**, Yadav, Ruchita, Parmar, N., Manjul, S.K., Swaroop M., Hou J., Xiaoyan Yang, X. **(2026)**. Molecular evidence for animal exploitation in the Indus Civilization from organic lipid residue analysis of pottery vessels *Quaternary Research* (In production) **(IF: 2.3)**.
3. **Yadav, R.**, Srivastava, A., Bhattacharya, G., Mishra, N., Bikkina, S., & **Pokharia, Anil K. (2026)**. Insights on agriculture intensification, trade and localised adaptation based on radiocarbon-dated carbonised seeds from the Iron Age to the Early Medieval Period at Uren, Bihar, Eastern India. *Journal of Archaeological Science: Reports*, 74, 105942. **(IF: 1.6)**
4. Swaroop, M., Sharma, S., Yadav, R., Yang, X., Dong, G., Uesugi, A., ... & **Pokharia, Anil K. (2026)**. Archaeobotanical data from a Baran settlement (4,300–3,400 yrs bp) in the Ghaggar

basin (northwestern India) reveals continuity of the Indus crop package after the Meghalayan stage drought. *Vegetation History and Archaeobotany*, 1-15. (IF: 2.5)

5. Patel, H., Yadav, R., Sontakke, V.G., Vaidya, S., Ganvir, S., Quamar, M.F., Morthekai, P., Tang, L., Swaroop, M., Srivastava, A. and Spate, M., **Pokharia Anil K. (2026)**. Evaluating the Indian Summer Monsoon intensity using archaeological seeds from early–late historic Vidarbha, Central India. *The Holocene*, 36(1): 80-94. (IF: 1.6).

6. **Pokharia, Anil K**, Singh, Pushp Lata, Yadav, Ruchita, Swaroop, M., Srivastava, A., Sharma S., Kumar, A., Shukla, Dipak, Singh, U., Gupt, C., Afroz, M., Gahlaud, S. S. (2025). Archaeological and archaeobotanical investigations in Tamsa region of Ganga Plain, Uttar Pradesh. *Journal of The Palaeontological Society of India*. 70(1):306-320.

7. Trivedi, S., Srivastava, A., Basumatary, S. K., **Pokharia, Anil K. (2025)**. Seasonal nectar sources and pollen-vegetation relationship in densely vegetated ecosystems of the Gangetic Plain, Uttar Pradesh, India. *Journal of the Palaeontological Society of India*, 70(1), 293-305. (IF: 0.90).

8. Sharma, S., Agnihotri, R., **Pokharia, Anil K.**, Kumar, A., Manjul, S.K. and Bhattacharyya, R., (2024). Agricultural resilience and land-use from an Indus settlement in north-western India: Inferences from stable Carbon and Nitrogen isotopes of archaeobotanical remains. *Archaeological and Anthropological Sciences*, 16(5), p.68. (IF: 2.3).

9. Yadav, Ruchita, Srivastava, A., Bhattacharya, G., Mishra, N. K., **Pokharia, Anil K. (2024)**. Insights from carbonized seeds: agricultural systems in Lower Ganga Plain (3000 yrs BP). *Current Science*, 127 (12):1394-1396. (IF: 1.102)

10. Sharma, S., **Pokharia, Anil K.**, Gahlaud, S., Patel, N., Sanjay, M., Yadav, Ruchita, Agnihotri, R. (2024). Royal Burials and Chariots from Sinauli (Uttar Pradesh, India): Radiocarbon dating and isotopic analysis-based Inferences. *Radiocarbon*, 66(4):774-782. (IF: 1.5).

11. Seth, D., Chakraborty, A., Choudhary, G., Sarkar, A., **Pokharia, Anil K.**, Yadav Ruchita, Kajle, M., Rajput, K., Ambekar, A. (2024) Did environment factors lead to the rise and spread of a fertility cult in Early Historical India?: A case study of Lajja Gauri vis-à-vis Shakambhari from Vadnagar, Gujarat. *Man and Environment*, XLIX (1): 91-108.

12. **Pokharia, Anil K.**, Patel, H., Ambekar, A.S., Spate, M., Tripathi, D., Sharma, S., Agnihotri, R., Strickland, K.M., González-Carretero, L., Bhushan, R. and Srivastava, A., Yadav, Ruchita, Shivam, A., Dhabi, A.J., Singh, K.P. (2024). Agricultural adaptation and resilience through climatic shifts in semi-arid India: 2000 years of archaeobotanical evidence from Vadnagar, Gujarat. *Quaternary Science Advances*, 13: 100155. (IF: 3.4).

13. Sharma, S., **Pokharia, Anil K.**, Kumar, A., Srivastava, A., Yadav, R. (2022). *Carthamus* L.: Origin, distribution and archaeological records in ancient India. *Journal of Palaeosciences*, 71(2): 177-186.

14. Trivedi, A., Srivastava, A., Farooqui, A., Salman, K., **Pokharia, Anil K.**, Ferguson David Kay, Singh, V.K. (2022). Pollen morphological study in subfamily Papilionoideae using Confocal Laser Scanning Microscopy. *Journal of Palaeosciences*, 71(2): 123-142.
15. Joshi, J., Tiwari, G., **Pokharia, Anil K.** (2022). Distinguishing change in late Harappan subsistence pattern: a comparative study. *Man and Environment* XLVIII (2): 45-50.
16. Dimri, A.P., Roxy M., Sharma, A., **Pokharia, Anil K.**, Gayathri, Ch. R., Sanwal, J., Sharma, A., Tandon, S.K., Pattanaik, D.B., Mohanty, U.C. (2022). Monsoon in history and present. *Journal of Palaeosciences*, 71(1): 45-74.
17. Ritchey, Melissa M., Sun, Yufeng, Matuzeviciute, GiedreMotuzaite, Shoda, S., **Pokharia, Anil K.** Spate, M., Tang, Li, Song, Jixiang, Li, Haiming, Dong, Guanghui, Vaiglova, Petra, Frachetti, M., Liu, Xinyi. (2022). The Wind that Shakes the Barley: the role of East Asian cuisines on barley grain size. *World Archaeology*.doi: 10.1080/00438243.2022.2030792.
18. Spate, Michael, Yatoo, Mumtaz A., Shen, Hui, **Pokharia, Anil K.**, Shah, Mohammad Ajmal, Betts, Alison. (2022). Cereal size, AMS and charcoal data from phase 1 of the Kashmir Prehistory Project. *Journal of Archaeological Science: Reports*, [https://doi.org/ 10.1016/j.jasrep.2022.103369](https://doi.org/10.1016/j.jasrep.2022.103369). (IF: 1.6).
19. **Pokharia, Anil K.**, Basumatary, Sadhan K., Thakur, Biswajeet, Tripathi, Swati, McDonald, H. Gregory, Tripathi, Deepika, Tiwari, Pooja, Asperen, Eline Van, Spate, Michael, Chauhan, Gaurav, Thakkar, Mahesh G., Agarwal, Shailesh. (2022). Multiproxy analysis on Indian wild ass (*Equushemionuskhur*) dung from Rann of Kachchh Western India and its implications for the palaeoecology and archaeology of arid regions. *Review of Palaeobotany and Palynology*, doi.org/10.1016/j.revpalbo. 2020.104208. (IF: 1.9).
20. Tripathi, D., **Pokharia, Anil K.**, Parmar, N., Kumar, Pankaj, Srivastava, A., Sharma, R. (2022). Insights on the Indus settlement in the palaeo-Saraswati Basin, Bhiwani District, Haryana, India. *Current Science*, 122(10): 1126-1128. (IF: 1.102).
21. Basumatary, S.K., Gogoi, Rajib, Tripathi, Swati, Ghosh, Ruby, **Pokharia, Anil K.**, McDonald, H. Gregory, Sherpa, Norbu, Asperen,Eline N. van et al....(2021). Red Panda feces from Eastern Himalaya as a modern analogue for palaeodietary and palaeoecological analyses. *Scientific Reports*, 11:18312. (IF: 2.9).
22. **Pokharia, Anil K.**, Sharma, S., Rawat, Y.S., Srivastava, A., DigheBhushan, Pande, P. (2021). Rice, beans and pulses at Vadnagar: an early historical site with a Buddhist Monastery in Gujarat, western India. *Geobios*, 64:77-99. (IF: 1.7).

23. Patel, H., **Pokharia, Anil K.**, Nihildas, N., Rai, N., Sinha, Rajeshwar P. (2021). RithiRanjana: reconstructing crop economy based on archaeobotanical evidence and radiocarbon dates from an Early Iron Age site in Vidarbha region, Maharashtra, India. *Current Science* 120 (11): 1728-1739. (IF: 1.102).

24. Nihildas N., **Pokharia, Anil K.**, Patel, H. (2021). Rice production in the Early Iron Age of Vidarbha: Archaeological and Archaeobotanical Evidences from RithiRajana, Maharashtra. *Man and Environment*, XLVI (1): 92-100.

25. **Pokharia, Anil K.**, Trivedi, A., Tripathi, D., Srivastava, C., Tewari, D.P., Menon, Jaya, Varma, S., Srivastava, A., Vaishali. (2021). Palaeodiet, Palaeoecology and Palaeoenvironment during 1200 BCE-300 CE in the Ganga Plain: A Palaeoethnobotanical and Palynological Approach. *The Palaeobotanist*, 69: 1-25.

26. Tripathi, D., Kotlia, B.S., Tiwari, M., **Pokharia, Anil K.**, Agrawal, S., Kumar, P., Long, T., Mortheikai, P., Thakur, B., Pal, J.N., Mahar, K.S., Chauhan, D.K. (2020). New evidence of mid-to late- Holocene vegetation and climate change from a Neolithic settlement in western fringe of Central Ganga Plain: Implications for Neolithic to Historic phases. *The Holocene*. doi: 10.1177/095968620972770. (IF: 1.6).

27. Yattoo, Mumtaz A., Spate, Michael, Betts, Alison, **Pokharia, Anil K.**, Shah, M. A. (2020). New evidence from the Kashmir Valley indicates the adoption of East and West Asian crops in the western Himalayas by 4400 years ago. *Quaternary Science Advances*. doi.org/10.1016/j.qsa.2020.100011. (IF: 3.4).

28. **Pokharia, Anil K.**, Kharakwal, J.S., Sharma, S., Spate, M., Tripathi, D., Dimri, A. P. Liu, Xinyi, Thakur, B., Basumatary, S.K., Srivastava, A., Mahar, K.S., Singh, K.P. (2020). Variable monsoons and human adaptations: Archaeological and palaeoenvironmental records during the last 1400 years in north-western India. *The Holocene*. doi: 10.1177/0959683620919976. (IF: 1.6).

29. Sharma, S., Manjul, S.K., Manjul, A., Pande, P.C., **Pokharia, Anil K.** (2020). Dating adoption and intensification of food-crops: insights from 4MSR (Binjor), an Indus (Harappan) site in northwestern India. *Radiocarbon*. doi:10.1017/RDC.2020.37. (IF: 1.5).

30. Basumatary, S.K., Singh, H., Asperen, Eline N.van, Tripathi, S., McDonald, H. Gregory, **Pokharia, Anil K.** (2020). Coprophilous and non-coprophilous fungal spores of *Bosmutus* modern dung from the Indian Himalaya: Implications to temperate paleoherbivory and paleoecological analysis. *Review of Palaeobotany and Palynology*. doi.org/10.1016/j.revpalbo.2020.104208. (IF: 1.9).

31. Dighe, B., Singh, M.R., **Pokharia, Anil K. (2020)**. Ancient Indian technique for sustainable and environmentally friendly decorative earthen plasters of Karle and Bhaja Caves, India. *Materials Today: Proceedings*. doi.org/10.1016/j.matpr.2020.02.040 2214-7853/2020.02.040.

32. Sharma, S., Agnihotri, R., **Pokharia, Anil K.**, Phartiyal, B., Bajpai, S., Pande, P.C., Manjul, S.K., Manjul, A., Maharana, C. and Ojha, S.N. (2020). Environmental magnetic, Geochemical and Sulfur isotopic imprints of an Indus archaeological site 4MSR from western India (Rajasthan): Implications to the Indus industrial (metallurgical) activities. *Quaternary International*. doi.org/10.1016/j.quaint.2020.03.038. (IF: 2.2).

33. **Pokharia, Anil K.**, Kharakwal, J.S., Sharma, S., Godhal, V., Singh, K.P. (2020). Archaeobotany at Chandravati: A multicultural site in southern Rajasthan. *Indian Journal of Archaeology*, 5 (3): 1516-1540.

34. **Pokharia, Anil K.**, Singh, P., Mishra, N., Kumar, A., Singh, U., Srivastava, A., Trivedi, A., Patel, H., Shukla, D.K., Gupta, C.B., Md. Afroz. (2019). Plant macroremains from Sarethi: an Early Historic site in Saryu region of Ganga Plain, Uttar Pradesh. *The Palaeobotanist*, 68: 125–137.

35. Basumatary, S., Singh, H., MacDonald, Gregory P., Dixit, S., **Pokharia, Anil K. (2019)**. Modern botanical analogue of endangered Yak (*Bosmutus*) dung from India: Plausible linkage with extant and extinct megaherbivores. *PLoS ONE* 14(3): e0202723. doi.org/10.1371/journal.pone.0202723. (IF: 2.76)

36. Thakur, B., Seth, P., Sharma, A., **Pokharia, Anil K.**, Spate, M., Farooqui, S. (2019). Linking past cultural developments to palaeoenvironmental changes from 5000 yrs ago to present: A climate-culture reconstruction from Harshad estuary, Saurashtra, Gujarat, India. *Quaternary International*, 507: 188-196.

37. Spate, M., Betts, A., Yattoo, Mumtaz A., Kaloo, Z., Fraser, J., Rashid, Y., **Pokharia, Anil K.**, Zhang, G. (2019). The northern Neolithic of the western Himalayas: New research in the Kashmir Valley. *Archaeological Research in Asia*, 18: 17-39. (IF: 1.4).

38. Kaushal, R., Ghosh, P., and **Pokharia, Anil K. (2019)**. Rapid hydroclimatic shift during Harappan civilization affecting rice agriculture: evidence from stable isotopic measurements. *Quaternary International*. doi.org/10.1016/j.quaint.2019.04.017. (IF: 2.2).

39. Srivastava, A. and **Pokharia, Anil K. (2019)**. Pollen photomicrographs of traditional herbal medicinal plants as an aid to archaeopalynology of archaeological sites. *Pragdhara*, 26: 44-63.

40. **Pokharia, Anil K.**, Mani, B.R., Spate, M., Betts, A., Srivastava, A. (2018). Early Neolithic agriculture (2700-2000 BC) and Kushan period developments (AD 100-300): Macrobotanical evidence from Kanispur in Kashmir, India. *Vegetation History and Archaeobotany*, 27 (3): 477-791. (IF: 2.5).
41. Nihildas, N., Pradhan, P.P., Mehar, R., Sonone, P., Kushwaha, A., Thakur, B., Batt, A., Arshad, Singh, S., **Pokharia, Anil K.**, Shete, G., Joglekar, P.P. (2018). Preliminary report on excavation at RithiRanjana, Saoner Tehsil, Nagpur District, Maharashtra. *Man and Environment*, XLIII (1): 44-47.
42. Chauhan, M.S., **Pokharia, Anil K.**, Bhandari, Y. (2018). Quaternary vegetation, climate, farming and human habitation in the Ganga Plain, based on pollen and macro-botanical remains from lakes and archaeological sites. *Indian Journal of Archaeology*, 3(2): 1-65.
43. Liu, Xinyi, Lister, Diane L., Zhao, Z., Petrie, Cameron A., Xing sheng Zeng, Jones, Penelope J., Richard, A. Staff, **Pokharia, Anil K.**....., etc. (2017). Journey to the East: diverse routes and variable flowering times for wheat and barley *en route* to prehistoric China. *PLoS ONE*. doi.org/10.1371/journal.pone.0187405. (IF: 2.76).
44. **Pokharia, Anil K.**, Agnihotri, R., Sharma, S., Bajpai, S., Nath, J., Kumaran, R. N., Negi, B. C. (2017). Altered cropping pattern and cultural continuation with declined prosperity and extreme arid event at ~4.2ka BP: Evidence from an Indus archaeological site Khirsara, Gujarat, western India. *PLoS ONE*. doi.org/10.1371/journal.pone.0185684. (IF: 2.76).
45. Tripathi, D., Chauhan, D.K., Farooqui, A., Kotlia, B.S., Thakur, B., Morthekai, P., Long, T., Chauhan, M.S., **Pokharia, Anil K.** (2017). Late Quaternary climatic variability in the Central Ganga Plain: A multi-proxy record from Karela Jheel (Lake). *Quaternary International*, 443: 70-85. (IF: 2.2).
46. Chauhan, M.S., **Pokharia, Anil K.**, Bhandari, Y., Srivastava, R.K. (2017). Late Quaternary vegetation, climate change and human occupation in the Central Ganga Plain as inferred by pollen evidence from Karela Jheel, Uttar Pradesh. *Indian Journal of Archaeology*, 2(1): 1-24.
47. **Pokharia, Anil K.**, Sharma, S., Tripathi, D., Mishra, N., Pal, J.N., Vinay, R., Srivastava, A. (2016). Neolithic-Early Historic (2500-200 BC) plant use: the archaeobotany of Ganga Plain. *Quaternary International*, 443: 223-237. (IF: 2.2).
48. Liu, Xinyi, Lister, D.L., Zhao, Z., Staff, R.A., Jones, P., Zhou, L., **Pokharia, Anil K.**, Petrie, C.A., Pathak, A., Lu, H., Matuzeviciute, G. M., Bates, J., Pilgram, T.K., Jones, M.K. (2016). The virtues of small grain size: potential pathways to distinguishing feature of Asian wheats. *Quaternary International*, 426: 107-119. (IF: 2.2).

49. Kharakwal, J.S., **Pokharia, Anil K.**, Sharma, K.K., Godhal, V., Paliwal, N., Singh, K.P., Menaria, R., and Garg, P. (2016). Preliminary observations of excavation at Chandravati, Sirohi, Rajasthan. *Sodh Patrika* (266-269): 20-54.
50. **Pokharia, Anil K.** (2016). Harappan plant economy and the role of millets in the peripheral zone of Indus civilization. *Indian Journal of Archaeology*, 1(4): 66-76.
51. Chauhan, M.S., **Pokharia, Anil K.**, Srivastava, R.K. (2015). Late Quaternary vegetation history, climatic variability and human activity in the Central Ganga Plain, deduced by pollen proxy records from Karela Jheel, India. *Quaternary International*, 371: 144-156. (IF: 2.2).
52. **Pokharia, Anil K.**, Srivastava, C., Vikram, B., Dimri, D.N., Nautiya, C.M., Sharma, S. (2015). On the botanical findings from excavations at Ahichchhatra: A multi-cultural site in Upper Ganga Plain. *Current Science*, 109 (7): 1293-1304. (IF: 1.102).
53. **Pokharia, Anil K.**, Kharakwal, J.S., Srivastava, Alka. (2014). Archaeobotanical evidence of millets in the Indian subcontinent with some observations on their role in the Indus civilization. *Journal of Archaeological Sciences*, 42: 442-455. (IF: 2.9).
54. **Pokharia, Anil K.**, Srivastava, C. (2013). Current status of archaeobotanical studies in Harappan civilization: An Archaeological Perspective. *Heritage: Journal of Multidisciplinary Studies in Archaeology* 1: 118-137.
55. Goyal Pankaj, **Pokharia, Anil K.**, Kharakwal, J.S., Joglekar, P., Rawat, Y.S., and Osada, T. (2013). Subsistence system, palaeoecology and ¹⁴C chronology at Kanmer, a Harappan site in Gujarat, India. *Radiocarbon*, 55(1): 141-150. (IF: 1.5).
56. **Pokharia, Anil K.**, Tiatoshi, J., David, Testo, Zokho V. (2013). Late first millennium BC to second millennium AD agriculture in Nagaland: A reconstruction based on archaeobotanical evidence and radiocarbon dates. *Current Science*, 104 (10): 1341-1353. (IF: 1.102).
57. **Pokharia, Anil K.**, Kharakwal, J.S., Rawat, Y.S., Osada, T., Nautiyal, C.M., Srivastava, A. (2011). Archaeobotany and archaeology at Kanmer, a Harappan site in Kachchh, Gujarat: evidence for adaptation in response to climatic variability. *Current Science*, 100 (12): 1833-1846. (IF: 1.102).
58. **Pokharia, Anil K.** (2011). Palaeoethnobotany at Lahuradewa: A contribution to the 2nd millennium BC agriculture of the Ganga Plain, India. *Current Science*, 101 (12): 1569-1578. (IF: 1.102).

59. **Pokharia, Anil K.**, Srivastava, C., Pal, J.N. (2011). Palaeoethnobotanical and Palaeoecological investigations based on carbonized botanical remains from Neolithic-Chalcolithic Tokwa, Uttar Pradesh. *The Palaeobotanist*, 60 (2): 237-250.

60. **Pokharia, Anil K.**, Sekar, B., Pal, J.N., Srivastava, A. (2009). Possible evidence of pre-Columbian trans-oceanic voyages based on conventional LSC and AMS ¹⁴C dating of associated charcoal and a carbonized seed of custard-apple (*Annona squamosa* L.). *Radiocarbon*, 51(3):923-930. (IF: 1.5).

61. **Pokharia, Anil K.**, Pal, J.N., Srivastava, A. (2009). Plant macro-remains from Neolithic Jhusi in Ganga Plain: evidence for grain-based agriculture. *Current Science*, 97(4):564-571. (IF: 1.102).

62. Chauhan, M.S., **Pokharia, Anil K.**, Singh, I. B. (2009). Pollen record of Holocene vegetation, climate change and Human habitation from Lahuradewa Lake, SantKabir Nagar District, Uttar Pradesh, India. *Man and Environment*, XXXIV(1): 88-100.

63. **Pokharia, Anil K.** (2008). Palaeoethnobotanical record of cultivated crops and associated weeds and wild taxa from Neolithic site, Tokwa, Uttar Pradesh, India. *Current Science*, 94 (2): 248-254. (IF: 1.102).

64. **Pokharia, Anil K.** (2008). Record of macrobotanical remains from the Aravalli Hill, Ojiyana, Rajasthan: Evidence for agriculture-based subsistence economy. *Current Science*, 94(5): 612-623. (IF: 1.102).

65. **Pokharia, Anil K.** (2008). Early Agricultural Economy in North-Eastern Vindhyas: An Archaeological Perspective. *The Palaeobotanist*, 57(1-2): 289-297.

66. Sekar, B., **Pokharia, Anil K.**, Prasad, Ravi G.V., Choudhary, R.K., Rajagopalan, G., Pal, J.N. (2007). Liquid scintillation counting and AMS ¹⁴C radiocarbon dating of associated charcoals and a carbonized seed of *Annona squamosa* L. to analyse its antiquity in India. *Current Science*, 93 (10): 1354-1356. (IF: 1.102).

67. Tewari, R., Srivastava, R.K., Singh, K.K., Saraswat, K.S., Singh, I.B., Chauhan, M.S., **Pokharia, Anil K.**, Saxena, A., Prasad, V., Sharma, M. (2006). Second preliminary report on excavation at Lahuradewa, SantKabir Nagar, Uttar Pradesh 2002-2003-2004 & 2005-2006. *Prāgdhārā*, 16: 35-68.

68. Chauhan, M.S., **Pokharia, Anil K.**, Singh, I.B. (2004). Preliminary results on the Palaeovegetation during Holocene from Lahuradewa Lake, District SantKabir Nagar, Uttar Pradesh. *Prāgdhārā*, 15:34-38.

69. Saraswat, K.S. and **Pokharia, Anil K. (2003)**. Palaeoethnobotanical Investigations at Early Harappan Kunal. *Prāgdhārā*, 13: 105-139.
70. Saraswat, K.S. and **Pokharia, Anil K. (2002)**. Harappan plant economy at ancient Balu, Haryana. *Prāgdhārā*, 12: 151-1751.
71. **Pokharia, Anil K** and Saraswat KS. (2000). Wood charcoal remains from ancient Sanghol, Punjab (ca. 100-300 AD). *Prāgdhārā*, 10: 149-171.
72. **Pokharia, Anil K** and Saraswat, KS. (1999). Plant economy during Kushana period (100-300AD) at ancient Sanghol, Punjab. *Prāgdhārā*, 9: 75-121.
73. Saraswat, K.S. and **Pokharia, Anil K. (1998)**. On the remains of botanical material used in fire-sacrifice ritualized during Kushana period at Sanghol, Punjab. *Prāgdhārā*, 8: 149-181.

Book/Book Chapters/Popular Scientific articles

74. Yadav, Ruchita Quamar F. M., **Pokharia Anil K (2026)**. Tracing Monsoon Variability through Archaeological Seeds of Central India. *Palaeoscience Today*, Vol. 2(1): 33-37.
75. **Pokharia, Anil K.**, Rai, N., Konar S., Yadav, Ruchita (2025). Understanding adaptation and resilience to variable climate during past two millennia at Vadnagar, western India. In: The story of Vadnagar unravelling 2500 years of continuity. Gujarat State Archaeology, Gandhinagar, pp. 129-137.
76. **Pokharia, Anil K.** Sharma, S., Manjul, S., Yadav, Ruchita, Srivastava, A. (2026). Archaeobotany at 4MSR (Binjor), an Indus settlement in Rajasthan, NW India. In: Singh, M. and Joseph, M (Eds.)– RIVIKIRTI-Felicitation Volume in Honour of Dr. R.S. Bisht (Padamshree), pp. 185-200.
77. Srivastava, Alka and. **Pokharia, Anil K. (2021)**. Antiquity of *Datura* L in India. In: Shirvalkar, Prabodh and Prasad, Esha (Eds.)– *Culture, Tradition and Continuity disquisitions in Honour of Prof. Vasant Shinde*, B.R. Publishing Corporation, Delhi, volume II, pp. 317-328.
78. Srivastava, A., and **Pokharia, Anil K. (2020)**. Pollen atlas of kitchen garden plants as an aid to archaeopalynology of ancient human settlement sites. In: Vatsyayan, K., Kumar, R. and Patil, C.B. (Eds.)–*Asian History and Indology: Asitayana* (commemoration volume of Late Professor C. Mani), B.R. Publishing Corporation, Delhi. pp. 123-140.
79. Jamir, T., Mushriff-Veena, **Pokharia, Anil K. (2014)** (Eds.)– *Archaeology of Naga Ancestral sites*. Heritage Publishing House, Nagaland.

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81. **Pokharia, Anil K. (2012).** On the record of plant remains at Harappan Kanmer: subsistence economy with a change. In: Kharakwal, J.S., Rawat, Y.S., Osada, T. (Eds.)- *Excavations at Kanmer 2005-06–2008-09*, Indus Project, RIHN, Kyoto, Japan, pp. 795-811.
82. Sattar, Mofarahus, Sharma, S.D., **Pokharia, Anil K. (2010).** History of rice in South Asia (Up to 1947). In: Sharma, S.D. (Ed.)- *Rice: Origin, antiquity and history*. Science Publishers. Enfield, New Hampshire, USA. pp. 225-271.
83. Saraswat, K.S., Tewari, R., Singh, Y.P., **Pokharia, Anil K (Eds.). (2004).** *Souvenir: XXXI Joint Annual Conference of Indian Archaeological Society, Indian Soc. of Prehistoric & Quaternary Studies, Indian History & Culture Society & Folk and Tribal Arts and Culture Society*, Lucknow.
84. **Pokharia, Anil K., and Saraswat, K.S. (2004).** Birbal Sahni Institute of Palaeobotany: A Window on the Archaeology. *Souvenir: XXXI Joint Annual Conference of Indian Archaeological Society, Indian Soc. of Prehistoric & Quaternary Studies, Indian History & Culture Society & Folk and Tribal Arts and Culture Society*, Lucknow. (General Article).
85. Saraswat, K.S. and **Pokharia, Anil K. (1997).** Botanical evidence of fire-sacrificial ritual in Kushana period at ancient Sanghol, Punjab (ca. 100-300 AD). In: Joshi, J.P. (Ed.)- *Facets of Indian Civilization: Essays in Honour of Prof. B.B. Lal*, New Delhi: Aryan Books International, volume III, pp. 835-839.

14. Details of Project Completed:

Project Title	Whether completed/in progress	Sponsoring Agency	Amount of grant
Subsistence Pattern, Vegetation Dynamics, and Climate Change during Harappan (Indus) and Subsequent Cultures in North-Western India: A Palaeoethnobotanical Approach	Completed in 2019	SERB-DST, New Delhi	Rs. 46,03,000/=

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15. COLLABORATION (s)/LINKAGES

NATIONAL

- i) Archaeological Survey of India, New Delhi
- ii) AIHC and Archaeology Departments of various Universities
- iii) Rajasthan State Archaeology Department, Jaipur, Rajasthan
- iv) Uttar Pradesh State Archaeology Department, Lucknow, U.P.
- v) Tamil Nadu State Archaeology Department, Chennai
- vi) Rajasthan Vidyapeeth, Udaipur, Rajasthan
- vii) Gujarat State Archaeology Department, Gandhinagar, Gujarat

INTERNATIONAL

- viii) McDonald Archaeological Research Institute, Cambridge, UK
- ix) University College, London, UK
- x) Universitat Pompeu Fabra, Barcelona, Spain
- xi) Washington State University, St. Louis, USA
- xii) Research Institute for Humanity and Nature, Kyoto, Japan
- xiii) Sydney University, Sydney, Australia

16. VISIT(s) ABROAD

S.No.	Province/ Institute	Purpose	Duration	Year
1	Kyoto, Japan, Research Institute for Humanity and Nature	Visiting Research Fellow	July 1- September 30	2010
2	Paris, France	To attend 17 th IWGP conference	July 3-9	2016
3	Northwest University, Xian, China	To attend 5 th International conference of Palaeoethnobotany of China	September 10-14	2016
4	Northwest University, Xian, China	International Symposium of Palaeoethnobotanical Discoveries and Studies on the Tibetan Plateau and Surrounding Areas	December 16-19	2019

17. NATIONAL AND INTERNATIONAL STUDENTS OR EARLY CAREER RESEARCHERS HELPED/TRAINED IN ANYWAYS:

- i) Alexandra Slucky, Michael Spate of Australia

- ii) Melissa Ritchey, Xinyi Liu of USA
- iii) Kingwell-Benham, U.K.
- iv) Carla Lanceollitti, Spain
- v) Liya Tang, and Qin S., China
- vi) DeepikaTripathi, Shalini Sharma, Himani Patel, Neelam Mishra, Anjali Sharma, AnubhaPathak, UmraoVaishali, K.S. Mahar, K.P. Singh of India
- vii) Trained more than sixty PG Diploma students of Institute of Archaeology, ASI, New Delhi.

18. SUPERVISION

Doctoral

1. Shalini Sharma (Awarded in 2021), Kumaon University, Nainital, Uttarakhand and BSIP, Lucknow, U.P.
2. Ruchita Yadav (Submitted, 2026), CSJM University, Kanpur and BSIP, Lucknow
3. Mansi Swaroop (On going), AcSIR, Ghaziabad, U.P.

Post-Doctoral

Dr Deepika Tripathi (2019-2022)

Masters

Himani Patel, Neelam Mishra, Anjali Sharma, Anubha Pathak, Umrao Vaishali, K.P. Singh, Pankaj Goyal, Bhushan Dighe, Shalini Singh, Shreya, Shivani, Kajal Yadav

ACHIEVEMENTS

Archaeobotany in recent times has emerged as one of the advanced and increasingly popular subjects in the multidisciplinary researches to understand the human past in Dark Ages. The BSIP, Lucknow has in recent years played a very vital role as a helpmate to the archaeologists, ethnologists, prehistorians and anthropologists. Studies carried out have been quite rewarding with objectives to sketch the perspectives of early beginning of plant domestication, subsistence complexes of value in evolutionary and ecological potentials, exploitation of plants in their respective natural and cultural environments in different cultural settlements and diffusionary trends of early agriculture in diverse cultural zones in Indian subcontinent. A few noteworthy achievements are itemized as under:

CONTINUITY, ADAPTABILITY AND RESILIENCE: NEW PARADIGM IN INDUS VALLEY:

- i) Systematization of work on Harappan Civilization in ancient Punjab, Haryana, Rajasthan and Gujarat, has brought to light the convincing evidence of the vast array of data to suggest the cultivation of 29 types of crops of indigenous, West Asian, Eurasian and African origins, characterized by rotation of crops, during 3rd millennium BC (Saraswat and Pokharia, 2002, 2003; Pokharia et al., 2011)

- ii) Rice was not known to be a Harappan crop. However, archaeobotanical evidence of rice (direct dated...2400 BC) cultivation in Indus Valley, outside the zone of its natural habitats in Ganga Valley, seems in consequence of its dispersal from Ganga valley region at an early date, owing to the suitable moist conditions in this region (**Sharma et al., 2020**).
- iii) The Indus archaeological sites (Gujarat, western India) provides compelling evidence for a major change in cropping pattern from large grained cereals to small-grained millet crops at ~4,200 yrs BP, suggesting that it was probably the human response to prevailing monsoonal dryness (**Pokharia et al., 2011, 2014, 2017**). This could help in developing pragmatic socio-economic models in the wake of increasing warming, monsoonal dryness, and change in rainfall patterns.

DATING ADOPTION AND INTENSIFICATION OF FOOD-CROPS:

- iv) Direct dating of barley grains has pushed the antiquity of west Asian crop back to 2900 BCE (5000 yrs BP) so far in the Harappan context. Rice was not known to be Harappan crop, however, the direct date from 4MSR, Anupgarh, Rajasthan (~2340–2210 BCE) surmise rice cultivation during the Mature phase of the Indus civilization (**Sharma et al., 2020**), outside the zone of its natural habitats in Ganga Valley, seems in consequence of its dispersal from Ganga Valley region, owing to the suitable moist conditions in this region.

AHAR/BANAS VALLEY, RAJASTHAN:

- v) The “first” record of a rich and varied crop economy of the indigenous Ahar/Banas Valley Culture in the hilly terrains of Aravalli region, Rajasthan reflects on the skilled farming even in the hilly tracts. The impact of Harappans in the economy is apparent as the area lies south of the main Indus Valley zone. Evidence of rice, which is main crop of the Ganga Valley, deserves special mention. It is difficult to assess at present whether this crop spread in the Aravalli hills either through the Harappan zone in Haryana and Punjab or through some remote cultural contacts with other cultures. The information would significantly contribute to the development and expansion of agriculture, further to the south in the Chalcolithic zone of Malwa region, in MP (**Pokharia, 2008**).

GANGA VALLEY: NEOLITHIC TO EARLY HISTORIC CROP ECONOMY

- vi) Affluent information has been built up regarding the plant economy of early Mid-Ganga Valley cultures, with consistent chronologies based on radiocarbon dates. Now, it is no longer necessary to hesitate regarding the dispersal of food grains from the north-western Harappan area to Gangetic plains and vice-versa, at much earlier dates during 3rd and earlier half of 2nd millennia BC, undoubtedly as a result of the direct or indirect contacts (**Pokharia 2012; Pokharia et al., 2009, 2017**).

ASIAN-AMERICAN CONTACTS IN PRE-COLUMBIAN TIMES (TRANS-OCEANIC VOYAGES)

- vii) The most important find of the South American fruit of custard-apple (*Annonasquamosa*), from Neolithic, Iron-Age and Early Historic times, regarded to have been introduced in India by Portuguese in 16th century, and has pushed back the antiquity of custard-apple to 1600 BC on Indian soil. The evidence supports the Asian-American contacts, before the discovery of America by Columbus in 1498 (**Pokharia et al., 2007, 2009**).

BOTANICAL EVIDENCE OF RITUALIZATION IN ANCIENT INDIA

- viii) Studies on the botanical material used in offerings to sacred fire, during the ritualization of fire-sacrifice, in Kushana period (100-300 AD) at Sanghol, district Ludhiana, Punjab, has linked ritualistic and religious aspects with archaeology. From the fir-altars (hawan-kundas) mixture of seven types of food grains (rice, barley, wheat, mung, urad, masur and til), fruit remains of jujube, date, almond, raisin, chilgoza, pistachio nut and gular-fig, and herbal medicines evidenced by the fruit and seed remains of anwala, harra, jaiphal, tulsi, black-pepper, and khanda or asmania (*Ephedra*) have been found. The woods of pipal, gular, palash, kaitha, tamal, deodar and chandan were used for lighting the fire (Samidha) (**Saraswat and Pokharia 1998**).

FIRST RECORD OF ARCHAEOBOTANICAL REMAINS FROM NORTH-EASTERN INDIA

- ix) The information on the origin of agriculture in eastern India is obscure till date. However, the current study from six archaeological sites in Nagaland has revealed rice-millet cultivation during pre- and post-metallic phases and the potential for future research to study the antiquity of rice in India (**Pokharia et al., 2013**).

EARLY AGRICULTURE (2700–2000 BCE) IN NEOLITHIC KASHMIR, INDIA

- x) Botanical evidence from the Ceramic Neolithic phase reflects a nascent agriculture based on cold tolerant crops (barley, wheats, lentil, field pea and grass pea) related to farming patterns of adjacent cultures and possibly evidence for the earliest cultivation in the valley. The Kushan period is characterized by a double-cropping pattern, suggesting a change in agricultural practices associated with a population recovery following a post-Neolithic decline. Finds of *Juglans regia*, and *Prunus cf. amygdalus* shells in ceramic Neolithic levels, and *Vitis cf. vinifera*, *Emblica officinalis* and *Ziziphus cf. nummularia* in addition to *J. regia*, and *P. cf. amygdalus* during Kushan times suggest that horticulture and foraging played an important role in the diet of the occupants. The dataset provides new absolute dates (AMS) for the subsistence economy of the Ceramic Neolithic population in the Kashmir Valley. The directly dated wheat and barley provides the oldest dated cereals in Kashmir till date.

MONSOON VARIABILITY *vis-à-vis* HUMAN ADAPTATION DURING LAST 2000 YRS:

- xi) The rarity of Medieval sites, systematic excavations and multi-disciplinary work in the subcontinent, obscure the impact of two distinct climate anomalies– the Medieval Warm Period (MWP), followed by the Little Ice Age (LIA). The finds from the archaeological site located in the foothill zone of Mt. Abu, in Rajasthan indicate warm

and mild humid during pre-Medieval period (600–800 CE). During Medieval times (between ~800–1300 CE), a diversification in crop-assemblage and associated weeds suggest that the region was under warm and humid climate, corresponding to the Medieval Warm Period (MWP), known between 740 and 1150 CE worldwide. However, during post-Medieval period (~1300–1850 CE) dominance of drought-resistant millets along with meager large grained cereals and pulses indicate the region probably experienced weak SW monsoon, coinciding with globally recognized Little Ice Age (LIA). The changing cropping pattern, vegetation and cultural development, during aforementioned climate (monsoonal) contrast period provide clues for past human response to climate change and important lessons for modern societies in exploring possible strategies to future climate change (**Pokharia et al., 2020**).

BUDDHISM IN WESTERN INDIA AND CROP ECONOMY:

- xii) The first systematic evaluation on the subsistence economy during Buddhism (100 BCE-400 CE) from the site of Vadnagar, in western India is to be reckoned with. The spread of rice along with westward spread of Buddhism from its epicentre in Central India may have relied on seasonal rainfall (rain-fed cultivation) and not supported by irrigation as this region lacks major perennial rivers. Monsoonal variability would have caused an increase in rainfall for significant non-irrigated wet-rice agriculture. The study of the plant remains from Vadnagar Monastery site has proved to be informative and highlights the potential for research into the plant diversity during Buddhism in the subcontinent (**Pokharia et al., 2021**).

EARLY IRON AGE ECONOMY IN VIDHARBA, MAHARASHTRA:

- xiii) Rithi Rajana archaeological site excavated by Nagpur Excavation Branch, Archaeological Survey of India revealed that the founder elements of Chalcolithic subsistence in the region continued to exist in the crop economy of Early Iron Age settlers. Thus the present study provides useful insights regarding sequential agricultural history in the semi-arid Vidarbha region of Maharashtra.

PLANT ECONOMY DURING LAST 2500 Yrs AT VADNAGAR, GUJARAT:

- xiv) The plant remains from Historical site Vadnagar have revealed the presence of winter and summer crops, suggesting the region was likely warm and mild humid during Historic period (200 BCE-500 CE; RWP). The diversification in crop assemblage during Medieval period (**500-1300 CE; MWP**), suggest that the region witnessed intense monsoon precipitation whereas, the record of large number of drought-resistant millets during post Medieval period (**1300-1900 CE; LIA**) indicates a shift in agricultural pattern owing to weak SW monsoon thus, suggesting human adaptation in response to climate variability during last two millennia.

PLANT REMAINS FROM EARLY HISTORIC SITE ALAGANKULAM, CHENNAI:

- xv) Seeds of African origin *Adansonia digitata* (Baobab tree) which is regarded to have been introduced in 327 BC in Indian subcontinent along with *Tamarindus indica*, *Citrus* sp.,

and *Ziziphus* sp. were recorded Alagankulam archaeological site, Excavated by Department of Archaeology, Govt. of Tamilnadu, Chennai.

PLANT ECONOMY OF CAVE DWELLERS, NAGALAND:

- xvi) Records of pseudocereals (*Fagopyrum* sp., *Coix* sp., and *Amaranthus/Chenopodium* sp.) and one pulse crop *Vigna* sp. which may have been gathered for consumption were made. The *Fagopyrum* genus is native to the Indian subcontinent, much of Indochina, and central and southeastern China. Buckwheat (*Fagopyrum* sp.) is an important crop in the high-altitude regions of Northeast Indian Himalaya. It is used as food crop (pseudocereal). *Coix* sp. (Job's tear). It is native to South-East Asia. Job's tear grains are widely eaten as a cereal, and sometimes used as folk medicine. There are two main varieties of the species, one wild and one cultivated. The wild variety, *Coix lachryma-jobi* var. *lachryma-jobi*, has hard-shelled pseudocarps very hard, pearly white, oval structures used as beads for making rosaries, necklaces, and other objects. The cultivated variety *Coix lachryma-jobi* var. *ma-yuen* is harvested as a cereal crop. *Amaranthus/Chenopodium* genus of numerous species of perennial or annual herbaceous flowering plants known to occur almost anywhere in the world. These are also used as food crops (pseudocereals). A small endocarp of fruit was also recorded in the assemblage resembling dicotyledonous fruit. Based on these plant remains, it can be inferred that prehistoric man inhabited these caves during the mid to late Holocene and consumed these plants by gathering.

The information generated from archaeological sites in different regions of the subcontinent are of considerable significance to agricultural historians, archaeologists, anthropologists, ecologists, palaeoclimatologists, economic botanists, geneticists etc.