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Wooden Single Roofs in Slovenia: Tradition, Intangible Heritage, and Scientific Validation of Performance

Wood has been a traditional roofing material in Europe and beyond, with widespread use on significant buildings during the 17th century. Today, wooden roofing persists mainly on huts and houses in Alpine regions, where it represents both tangible and intangible cultural heritage. Despite its high cost, wooden roofing remains valued for its durability in harsh mountain climates, particularly in Slovenia. The most common roofing elements are split wooden shingles made from spruce (*Picea abies*) and occasionally larch (*Larix decidua*). Several traditional beliefs regarding the harvesting time, preparation, and performance of wooden shingles continue to circulate but lack scientific validation.

This study combined historical review, field surveys, documentation of the shingles production, laboratory experiments, and a citizen science approach. Laboratory and field tests were performed to evaluate the moisture performance of split and sawn shingles. Moisture monitoring was established on several roofs in Trenta Valley and in the Ljubljana test field. In parallel, a citizen science project was launched to document the distribution, condition, and typology of wooden roofs across Slovenia. Citizens contributed photographs and data on existing shingle roofs in various Alpine regions, including southern Carinthia, Trenta, the Gornjsavska Valley, and Velika Planina.

Experimental testing demonstrated no significant superiority of split shingles over sawn shingles in terms of moisture performance. The citizen science initiative provided extensive documentation of existing shingle roofs, enabling the mapping of their distribution and identifying regional practices in shingle application and maintenance.

The findings challenge long-held traditional beliefs about the superior durability of split shingles, emphasising the need for evidence-based approaches in preserving wooden roofing practices. At the same time, citizen participation has proven effective in recording the cultural and architectural significance of wooden roofs in Slovenia, contributing to both heritage preservation and scientific research. The combination of experimental testing and public engagement provides a framework for sustaining traditional Alpine architecture while safeguarding associated intangible heritage.

Acknowledgements

The Slovenian Research and Innovation Agency's financial support within the research programme P4-0015, research project J7-50231 (GROWTH), and the Infrastructure Centre (IC LES PST 0481-09 and Io-E012 E-RIHS) is accredited. This work was supported by the Wood-Innovate project, implemented within the framework of the Interreg V-A Italy-Slovenia co-operation programme and co-financed by the European Community.

3rd Annual Conference
of the Slovenian Node
of the European Research
Infrastructure
for Heritage Science

E-RIHS Slovenia
Koper, 18–19 November 2025

