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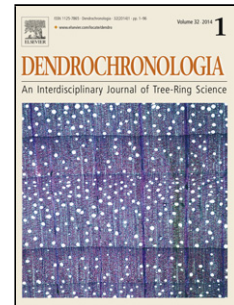
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## Dating fire events in *Pinus heldreichii* forests by analysis of tree ring cores

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### Abstract

1 Bosnian pine (*Pinus heldreichii* Christ, also known as *Pinus leucodermis* Antoine) is a relict  
2 species found in isolated locations in the mountains of the Balkan Peninsula and Southern Italy.  
3 The forests are of high conservational value because they are extremely rich in rare and endemic  
4 species of plants and fungi. Yet, the natural history and disturbance regime of *Pinus heldreichii*  
5 ecosystems is not well understood. Fire traces show that fires played a major role, but there is  
6 very limited historical data. Therefore proxy methods to reconstruct past events have to be used.  
7 The analysis of tree rings provides such an opportunity. To our knowledge, there have been no  
8 attempts to use tree ring cores from *Pinus heldreichii* trees to date fire events. Our aim was  
9 therefore to test if tree ring cores collected with an increment borer could successfully be used to  
10 date fires and verify other tree ring indicators caused by the fire events. We tested an approach  
11 that was based on extracting multiple cores from fire-scarred trees and nearby standing trees  
12 without injuries. A total of 136 cores from 99 trees were collected from which we dated all 34  
13 cores with fire scars. We found the exact fire years for 29 of the samples, and the remaining 5  
14 samples were approximately dated. Up to 83% of all sampled trees had additional growth  
15 reactions, mostly suppressions lasting 5 to 10 years after the fire years.

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