

LONG-TERM CHRONOLOGIES OF PINE (*PINUS SYLVESTRIS L.*)
AND FIR (*ABIES ALBA MILL.*) FROM THE MAŁOPOLSKA REGION
AND THEIR PALAEOCLIMATIC INTERPRETATION

ELŻBIETA SZYCHOWSKA-KRĄPIEC

Abstract. The studies aiming at construction of long incremental patterns for two coniferous tree species, *Pinus sylvestris* and *Abies alba*, from the Małopolska region were initiated at the Dendrochronological Laboratory of the Faculty of Geology, Geophysics and Environmental Protection, AGH University of Science and Technology in Kraków in the mid-1990s. These studies, successfully finished, resulted in two regional chronologies: 916-year pattern for the pine (1091–2006 AD), and 896-year fir chronology, covering the period 1109–2004 AD. Both these chronologies, exhibiting high similarity to the regional chronologies from the adjacent areas, are being used for dating wood from archaeological sites, architectural objects or mining excavations. Except for the primary goal, i.e. absolute dating of wood samples, they were also used as the proxy data in the prediction of the temperatures December–March (fir) and February–March (pine) for the last 900 years. In this way, the distinguished periods of cooling and warming fit in the general pattern of the long-term climate changes: the Mediaeval Warm Period, the Little Ice Age, and the Recent Global Warming. Some of the cool phases are convergent with the Wolf, Spörer, and Maunder Minima of the solar activity (sunspot populations). Short-term, but drastic changes of the climatic factors are marked in the chronologies newly constructed as the positive or negative signature years. The response function analysis demonstrated the positive dependence of the annual increments of the pine on the temperatures of two winter months (February–March) and the fir on the temperatures of the entire winter period, from December till March.

Key words: dendrochronology, dendroclimatology, reconstruction, pine, fir, Małopolska region, south Poland

Author's address: Elżbieta Szychowska-Krąpiec, Faculty of Geology, Geophysics and Environmental Protection, AGH University of Science and Technology, Al. Mickiewicza 30, 30-059 Kraków, Poland; E-mail: szycha@geol.agh.edu.pl