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## 学 位 論 文 要 旨

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題目: **Fundamental Studies of Radial Variations of Cell Dimensions  
and Ring Width within Elm Trees Grown in Arid Region in China**  
中国乾燥地に生育するシロニレ (*Ulmus pumila* L.) の細胞寸法と年輪幅の  
水平変動の基礎的な研究

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The desertification in China, where losing about a million acres a year to desertification, greatly influences the environment not only of China but of all Asia. In order to stop the trend of desertification, various anti-desertification combats, such as afforestation et al. were completed. Elm(*U. pumila* L.), which is widely distributed in the northern China, is considered as the most valuable species in sandy area by wood utilization and the characteristics of promoting vegetative diversity.

In this study, six elm trees have been selected to investigate the radial variation patterns of tree ring width and cell dimensions, such as: fiber length(FL), vessel element length(VEL), fiber increment and vessel lumen diameter(VLD).

As results, there is no distinct boundary separating juvenile wood and mature wood portions within the trunk of elm trees because of the constant VEL. After 22 to 26 years both the FL and VEL became stable. Then, a chronology from 1960 to 1999 was developed by using annual ring width indices of elm trees grown in the southern Hunshandake Desert. The precipitation from April to July had positive significant correlations, the temperature from June to July had a negative significant correlation to the tree-ring growth. Although the fiber increments showed no significant correlation to climatic variation, the VLD of individual trees showed some significant correlation to both monthly precipitation and mean temperature in general.

The detail information will help to reference in afforestation, and instructing the restoration and utilization of *U. pumila* L. species. It is also applicable to reforestation management.