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(*Cupressus arizonica*)

TAPPI ISO

$$\alpha = I / AI \quad (1)$$

$$I = bh^3 / 12$$

$$X_k = m_k^3$$

$$\cos(m) \cosh(m) = 1$$

$$F_{2k} = F_{1k}$$

$$F_k = \Theta^2(m_k) + \Theta(m_k) \quad (2)$$

$$F_k = \Theta^2(m_k) - \Theta(m_k) \quad (3)$$

$$\Theta(m_k) = [m_k \tan(m_k) \tanh(m_k)] / [\tan(m_k) - \tanh(m_k)]$$

$$(E/\rho)_k = [(\pi^2 / 12) f_k^2 / \alpha X_k] [1 + \alpha F_{1k}(m_k) + (\alpha \cdot E \cdot F_{1k} \cdot m_k) / KG]$$

$$b_k = a_k (E/\rho)$$

$$a_k = (E/\rho) - (E/KG) b_k \quad (4)$$

$$b_k = (\pi^2 / 12) f_k^2 / X_k \quad (5)$$

$$a_k = (\pi^2 / 12) f_k^2 (1 + \alpha F_{1k}) / \alpha X_k \quad (6)$$

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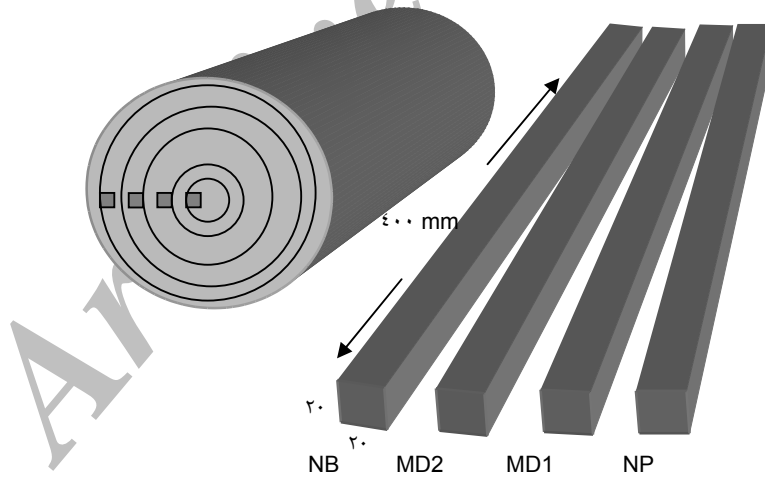
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Cupressus arizonica

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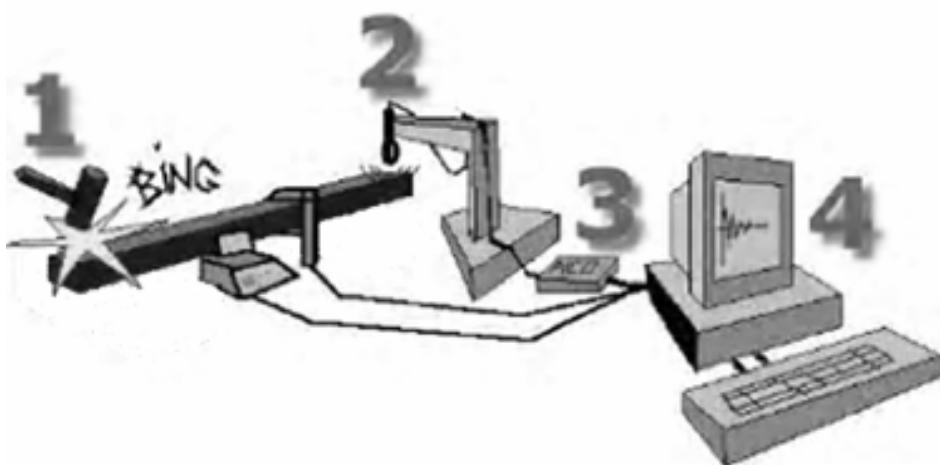


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" " TAPPI
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MOTIC



(CIRAD)

(E/KG)

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SPSS ver. 11.5
MS EXCEL

(FFT)

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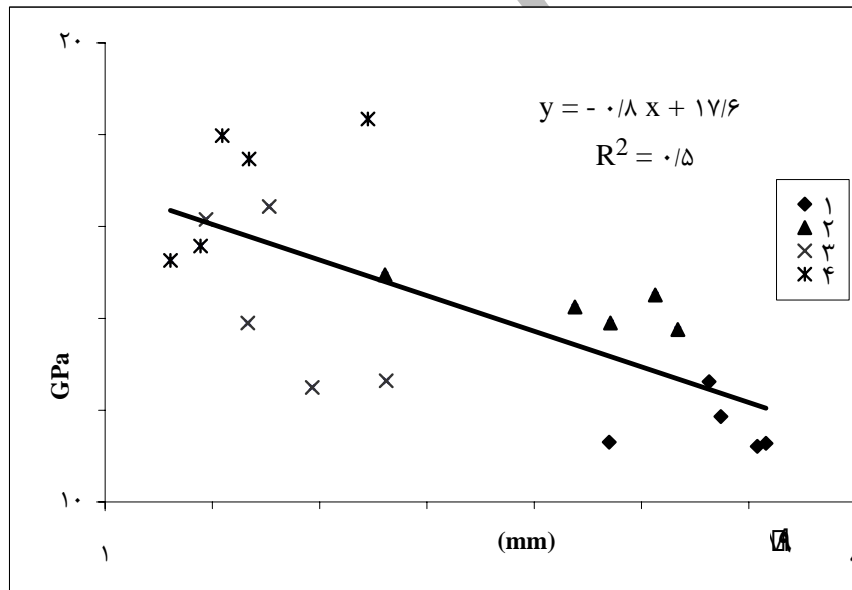
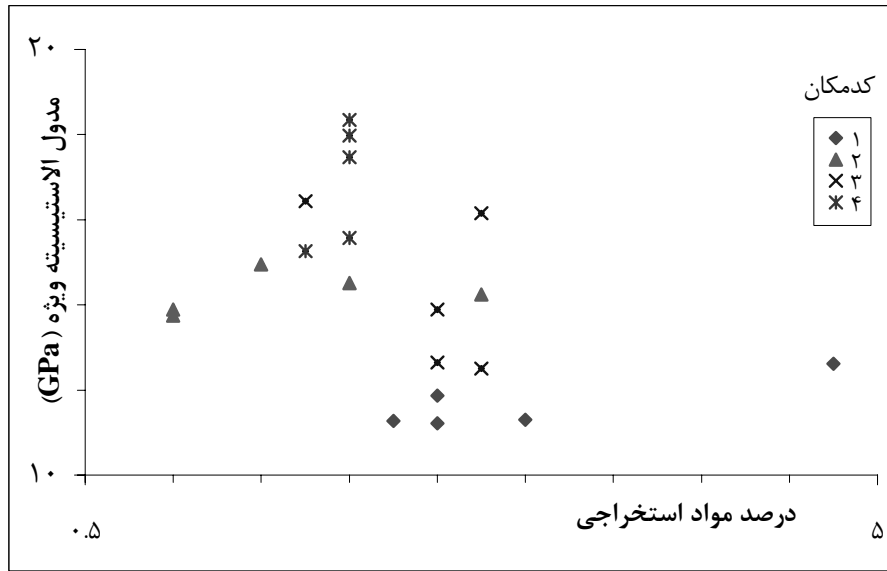
(Specific gravity)

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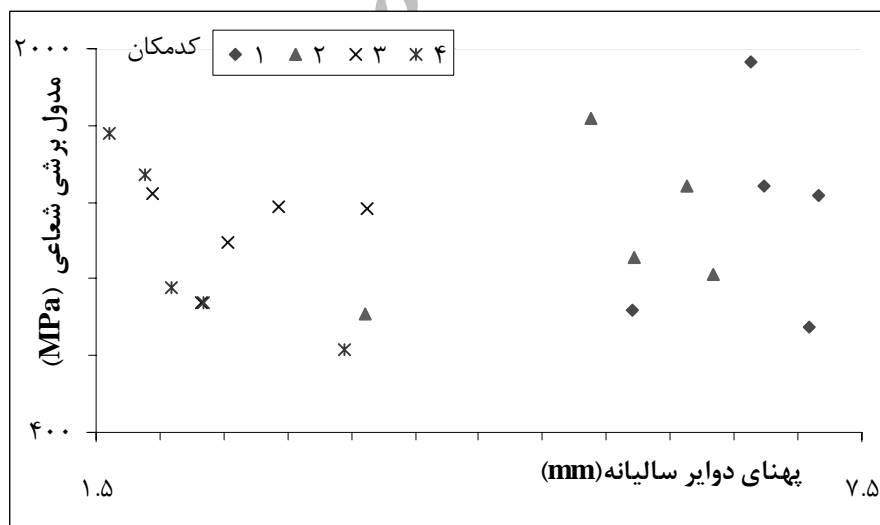
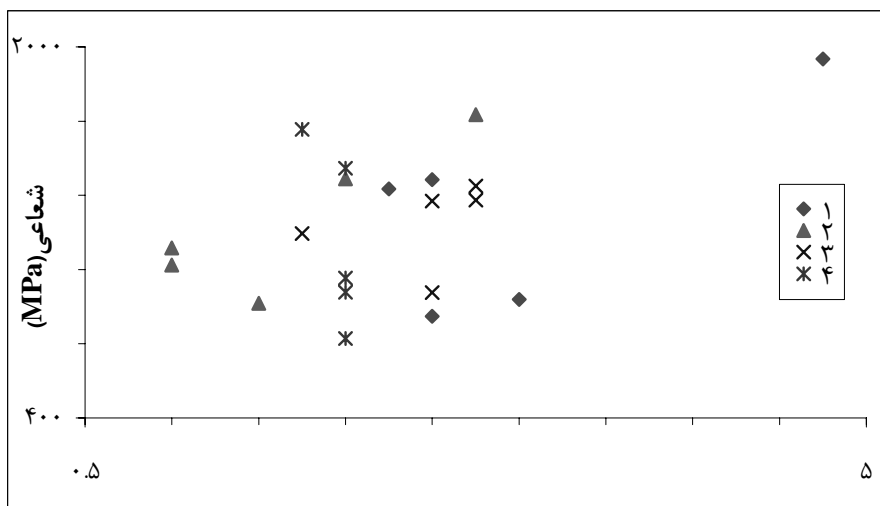
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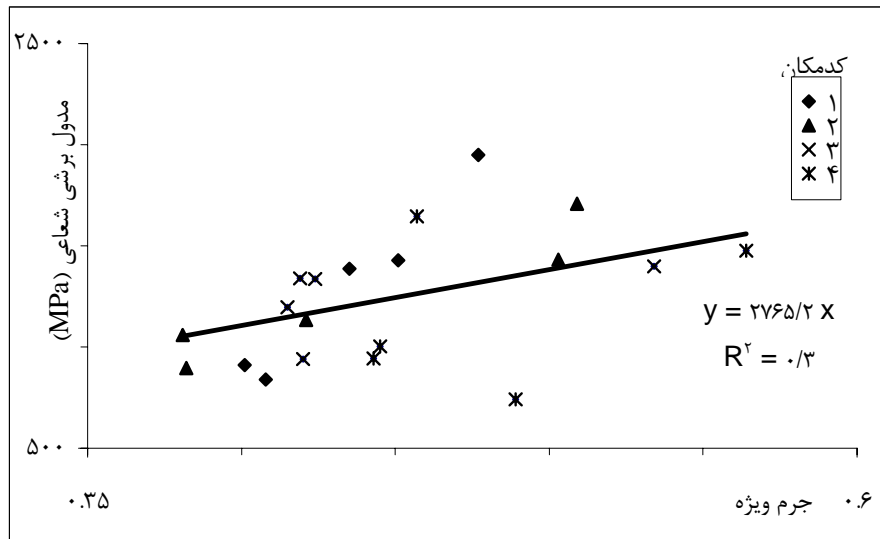
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Specific Gravity :

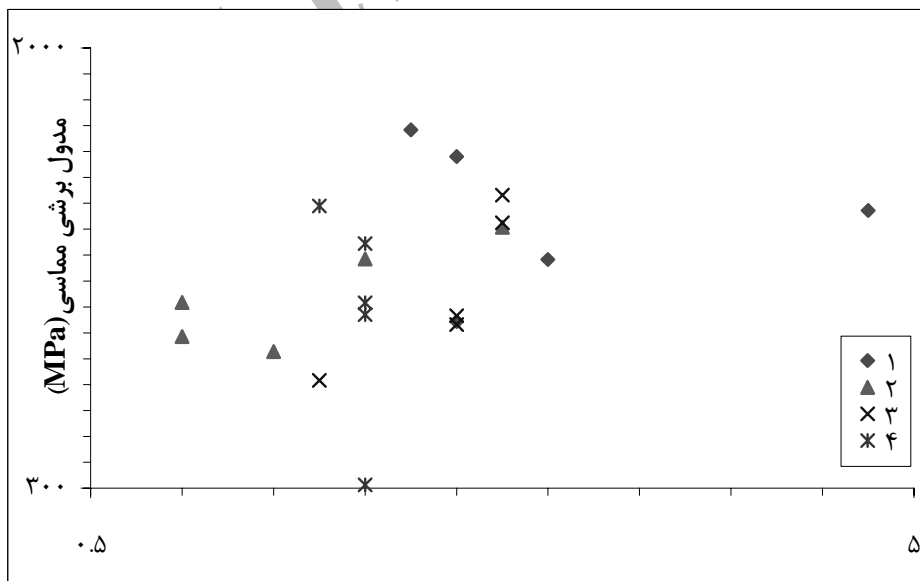


:(RG)

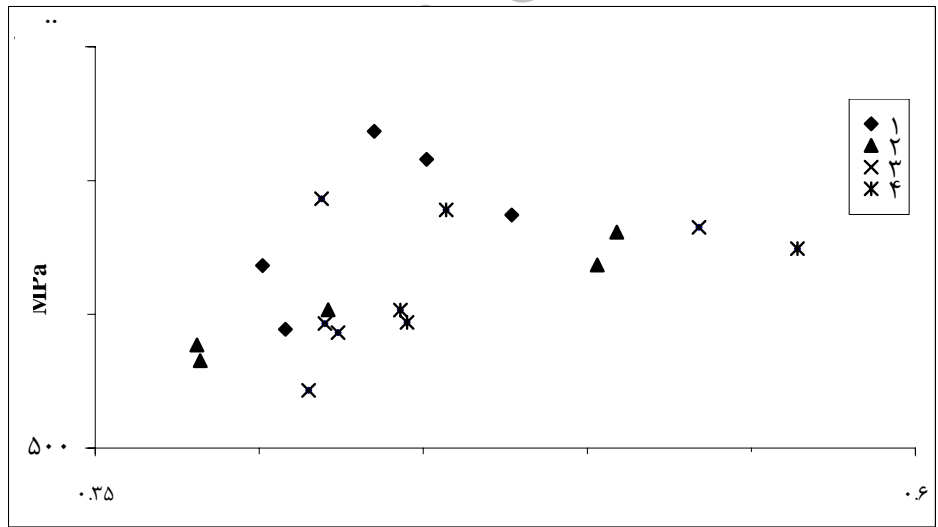
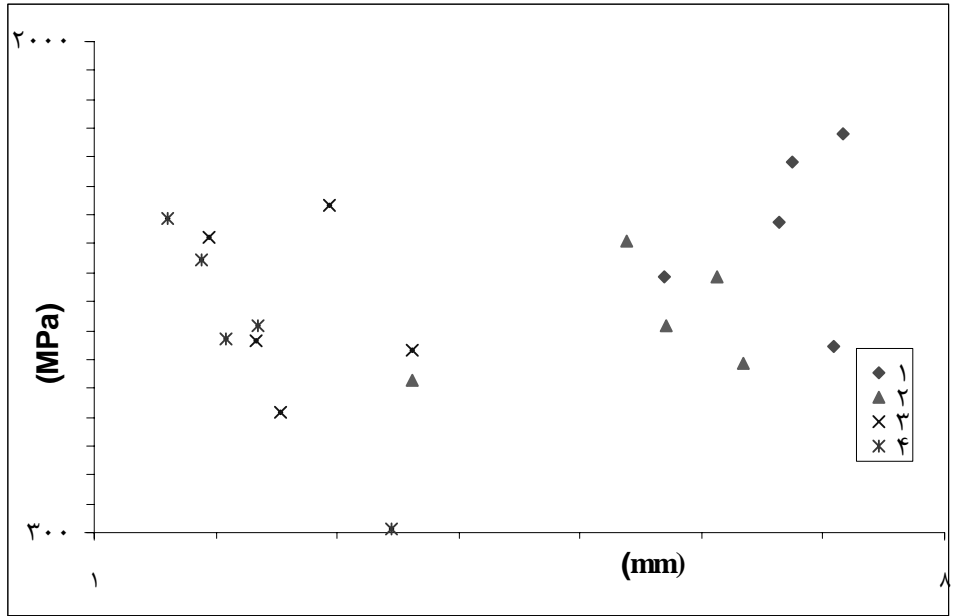




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A Study on Variations of Specific Modulus of Elasticity and Shear Moduli in Arizona Cypress Wood, using Vibration Method

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Abstract

In this research, specific modulus of elasticity and two shear moduli of *Cupressus arizonica* wood from pith to bark were investigated. Sampling was done, and samples provided from plantations in faculty of natural resources, University of Tehran, Karaj. Physical, chemical and mechanical specimens were prepared from four different locations from pith to bark, in accordance with ISO-International and TAPPI test method. For specific modulus of elasticity and shear moduli measurements, the NDT method was "Free vibration on free-free bar". Correlations between these moduli and ring-width, specific gravity and extractives content were studied. Results showed that specific modulus of elasticity decreases significantly from pith to bark and also there exists a significant correlation between this property and ring-width. There were no significant differences observed between shear moduli from pith to bark, but radial shear modulus did have a significant correlation with specific gravity.

Keywords: Arizona cypress, NDT, Mechanical properties, Modulus of elasticity, Vibration, Specific gravity

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