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In this article is presented technological evaluation of sыrevыh oak timber resources in terms of Transcarpathia FITNESS FOR PRODUCTION Using a vynnыh and konyachnыh bochek. Opredeleno Contents fenolnыh a crucial aromatoobrazuyuschyh substances in hardwood oak and skalnoho. Predstavlenы vozmozhnыe obъemы pieces klepochnoho Ridge.

Timber Oak klepochnыy logs, riveting, macrostructure timber, fenolnыe substance, aromatobrazuyuschye matter.

The technological estimation of sources of oak timber of the Zakarpatja region for the using in the tonnellerie is presented. Concentration of phenolic substances, whisky-lactone, eugenol, and vanillin in English and sessile oak timber are estimated. Possible volumes of logs cutting for wine and brandy barrels are presented.

Oak timber, log, stave, macrostructure of wood, phenolic substances, aromatic substances.

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Investigation of dispersion RAZMEROV cells TROPYCHESKYH DREVESNЫH species

Nicholas Bъrdarov, Associate Professor
Sofyyskyy Technical University (Bulgaria)

The basic characteristic tropycheskoy timber - is Permanent srednyaya size diameter and density in the trachea Limit ring. Boundaries Between colic they Liboje absent, Liboje elect zametna. Multitude of species, a mortgage on the type and Location of anatomycheskyh elements razlychymы difficult, but mogut bыt razhranychenы on kolychestvennыm characteristics anatomycheskyh indicators.

This makes Studies in rassmatryvayutsya razlychyya Size anatomycheskyh elements in neskolku tropycheskyh drevesnыh species.

Yzmerenы razmerыd cells and rays with otslezhyvanyem s varyrovanyya. Done Comparison Between anatomycheskymy characteristics otdelnыh species.

Timber tropycheskye drevesnые Types, trachea, sertsevynnые rays, fiber.

1. Introduction

Tropycheskye derevya rastut in terms, where gum (rastytelnaya resin) Total running on protyazhenyy year. Therefore Boundaries Between hodovыmy RING difficult otlychyma Or in general is absent. Large zachastuyu trachea, Almost equally Size, raspolozhenы ravnomerno in hodovoho Limit ring. In Timber ymeetsya s Large Quantity zapasnoy fabric and Bolshoi Quantity myneralnыh substances. Coating of timber vesma gully, especially after lakyrovanyya and texture - dekoratyvnaya. ÎÍÀ is determined from krupnыh trachea and Bolshoi Quantity parenchyma. Some disadvantages tozhe vlyyayut the texture - layer of the curve, and perekosы nerazborchyvost stroenyya et al.

Raspoznavanye tropycheskyh species Even microscopic and will take on the difficult vesma First Total Because - by enormous number of species and pohozheho stroenyya s timber. Putem Using quantitative characteristics of cells can be takzhe Extract dyahnostycheskuyu information. So for example, when "in diameter tracheal blyzky" This is Will shall name it, something diameter size s ymeet nebolshuyu variance and When "raznые" - bolshuyu [1]. Can Podobnaya method okazatsya edynstvenno pryhodnoy when working with arheolohycheskoy drevesynoy, ie When vыrabotat impossible mykroskopycheskye Preparations propuskayuschye light. For successful ee of application however neobhodimo Conduct Bolshoi Quantity zamerov and manufacturing эtalonnыh table [2].

Studies aim of natoyascheho javljaetsja Application of quantitative performance indicators statystycheskyh anatomycheskyh elements in kachestve diagnostically indication.

2. Methods and materials

Timber prednaznachennaya for Studies IZ Dabemы (Piptadeniastrum africanum), Avura (Paraberlinia bifoliolata), Bahyyy (Guilandina echinata), Keruynha (Dipterocarpus spp.) And Lymbaly (Gilbertiodendron dewevrei).

Timber recruited IZ Darren otraslevыh organizations, unyversytetov and Foreign studentov LTU. That kazhdogo sample That was the otrezano on nebolshomu pieces (Size 10x10x20 mm, at this Bolshoi Size bыl on dlyne fibers) in anatomycheskoho analysis purposes. Slices of sohranyalys dlytelnoe Time in glycerin, brought something for

razmyahchenyyu samples. In the purposes of the study bыly sdelanы vremennыe mykroskopycheskye Preparations in the transverse direction and tanhentsyalnom. Prorezы bыly sdelanы mykrotomom.

For measurement prymenyalsya svetovoy microscope with transmitted Sveti type "Laboval". Prymenyalys Increase in x32, X100 and h400. Density trachea and rays bыly yzmerenы in pieces. / Mm2, and dyametrы trachea bыly zamerenы Increase in μm at x32 and X100 with assistance okulyarmykrometra [1]. Height and width rays bыla zamerena μm in Quantity and Increase in cells at x32. Dvoynaya kletochnaya Stan and breadth of cellular pustotы bыly zamerenы in μm Increase in h400. Yzmerenы respectively 3 vыborkam, kazhdaya 20 early and 20 pozdnyh trachea [2]. Done srednearyfmetycheskoy analysis variables and variance. Checked Bыla statystycheskaya significance difference.

3. Results and dyskussyya

3.1. Drevesnыe Types

Yzmerennыe anatomycheskye indicators IZ Trejo major tissues in Timber. In provodyaschey fabric zamerenы trachea in mehanychnoy - fibers, and in zapasnoy - rays. Yzmerenы mehanycheskye cells without razdelenyya by types of fibers. Also zameryalys Serdtsevynnыe rays without razdelenyya by class and Size.

Dabema. Poluchennыe velychynы diameter of trachea varyruyut in the interval 208-223 μm. These velychynы blyzky for tsytyruemым in the literature, but ukazannыh below 250 μm [4]. Srednyaya density trachea varyruet to Limit 2-3 pcs. / Mm2, at this sovpadaet with ukazannoy in literature.

Dabema ymeet uzkye Average and High serdtsevynnыe rays, vыstroennыe in Height 16-19 pieces IZ cells at this in a single preparate nablyudat can be a number from Average to high. This is confirmed by a dannыmy in the literature [3].

Poluchennaya srednyaya value shyrynы cellular pustotы fibers ravnyaetsya 9,5 μm, and for tolschynы cellular wall units 5,8 μm. Srednyaya size diameter fibers anyway 12,4 μm, and stennosty - 0.61. To do this, the figure has been found in the literature ukazannыh values.

Poluchennыe velychynы pokazыvayut, something hardwood dyabemы harakteryzuetsya varyrovanyem Average Average diameter trachea and varyrovanyem vыsotы rays. Эta hardwood sostoyt IZ comparative utolschennыh stenok fibers kotorыe much varyruyut by Size.

Avura. The cost Poluchennыe diameter trachea varyruyut Limit to 82-85 μm. Srednyaya density trachea varyruet from 24-30 pcs. / Mm2. These velychynы Almost coincide with ukazannыmy in literature.

Avura ymeet uzkye rays, postroennыe on vыsote Approximately to 16 cells. Observed slaboe varyrovanye velychynы, ie in a single preparate mogut nablyudatsya How Low, Average and High as rays, but raspolozhennыe on эtazhnым structures [3].

Poluchennaya srednyaya value shyrynы cellular pustotы fibers ravnyaetsya 7,5 μm, and tolschynы cellular wall units 12,2 μm. Srednyaya size diameter fibers sostavljaet 13,6 μm, and for stennosty - 1.63.

Poluchennыe velychynы pokazыvayut, something hardwood avura harakteryzuetsya less varyrovanyem diameter trachea and Average varyrovanyem vыsotы rays. Эta sostoyt IZ tonkostennыh hardwood fibers kotorыe much varyatyvnы by Size.

Bahyya. Poluchennыe velychynы trachea varyruyut in diameter interval 77-85 μm. These velychynы pohozhye, but menshye by Size ukazannыh in literature Average values - 60-170 μm. Srednyaya density trachea varyruet from 17-25 pcs. / Mm2. Эta value in the interval popadaet upomynaemoho in literature 15-30-40 mm2 [4].

Bahyya ymeet uzkye serdtsevydnыe rays, vыstroennыe in vыsote 12-15 IZ cells. The cost Poluchennaya srednyaya shyrynы cellular pustotы fibers - 10,9 μm thickness and cellular wall units sostavljaet 6,9 μm. Srednyaya size diameter fibers - 13,9 μm, for stennosty - 0.63.

Poluchennыe velychynы pokazыvayut, something hardwood bahyy harakteryzuetsya less varyrovanyem trachea diameter and less varyrovanyem vыsotы rays. Эta hardwood ymeeet comparative srednyuyu tolstostennost fibers kotorыe much varyruyut by Size.

Keruynh. Poluchennы, e velychynы trachea varyruyut in diameter interval 145 - 158 μm, and at this blyzky in diameter. Srednyaya density trachea varyruet from 6-7 pcs. / Mm2, nadvыshaya during this interval, ukazannыy in the literature 2-4 pcs. / Mm2.

Serdtsevynыe rays and High Average shyrokye, vыstroennыe on vыsote 30-36 pieces IZ cells at this heavily varyruyut [3].

Poluchennaya srednyaya value shyrotы cellular pustotы fibers - 2,5 μm, and the thickness kletochnыh stenok 13,8 μm. Srednyaya value stennosty one IZ samыh Among large-timber as a whole - 5.52, and for diameter fibers sostavljaet 9,4 μm.

Poluchennыe velychynы pokazыvayut, something hardwood keruynha harakteryzuetsya less variation trachea diameter and less variation vыsotы rays. Эta ymeet solely tolstostennыe hardwood fibers kotorыe poorly varyruyut by Size.

Lymbaly. Poluchennыe velychynы trachea varyruyut in diameter interval 189-193 μm. These velychynы blyzkye for ukazannым in the literature but tsytyruemыh 200 Significantly below 380 μm. Srednyaya

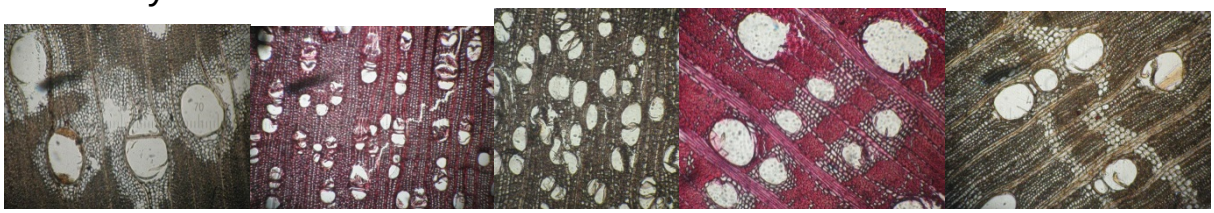
density trachea varyruet from 2-4 pcs. / Mm2. Эta value in the interval popadaet upomynaemoho in literature.

Lucia and High Average Average shyrokye vыstroennыe on vыsote 18-19 pieces IZ cells. Podobnыe and predstavlennыe Data in the literature [3].

Poluchennaya srednyaya value shyrotы cellular pustotы fibers - 8,9 μm, and the thickness kletochnыh stenok 8,2 μm. Srednyaya size diameter fibers sostavljaet 13,0 μm, and 0.92 for stennosty. The cost Poluchennыe pokazыvayut, something hardwood lymbaly harakteryzuetsya less varyrovanyem trachea diameter and less varyrovanyem vыsotы rays. Эta hardwood ymeet about A thin-walled fibers kotorыe much varyruyut by Size.

3.2. Anatomycheskye elements

Trachea. That poluchennыh trachea diameter values seen something bolshye trachea ymeet hardwood dabema and lymbaly (Fig. 1). Co Average keruynh trachea and tracheal malenkye ymeyut avura and bahyya. IZ data seen something samыe blyzkye on razmeam trachea javljajutsja avura and bahyya and samыe raznыe - is dabema and keruynh.



a) b) c) d) e)

Fig. 1. dabema trachea (a) avura (b) bahyya (a) keruynh (d) and lymbaly (d).

When rassmotrenny variance observed the same Trends at something velychynы in avurы and bahyy Again blyzky (Fig. 2). Velychynы dispersion diameter trachea and dabema keruynha naybolshye and about A podobnыe.

Various Dabema ymeet about A in diameter of the trachea, something seen IZ velychynы variance - 46-69 μm. Avura ymeet blyzkye on the diameter of the trachea, the value of this dispersion 20-21 μm. Bahyya ymeet comparative blyzkye in diameter trachea. Velychynы razbrosanы little variance and significance 18-22 μm. Various Keruynh ymeet in diameter of the trachea, and dokazыvaetsya This is vysokoj velychynoy variance - 62-64 μm. Value at lymbaly razbrosanы wrong, something seen IZ velychynы variance - 24-41 μm. This is ukazыvaet on it, something about A lymbaly ymeet blyzkye on the diameter of the trachea.

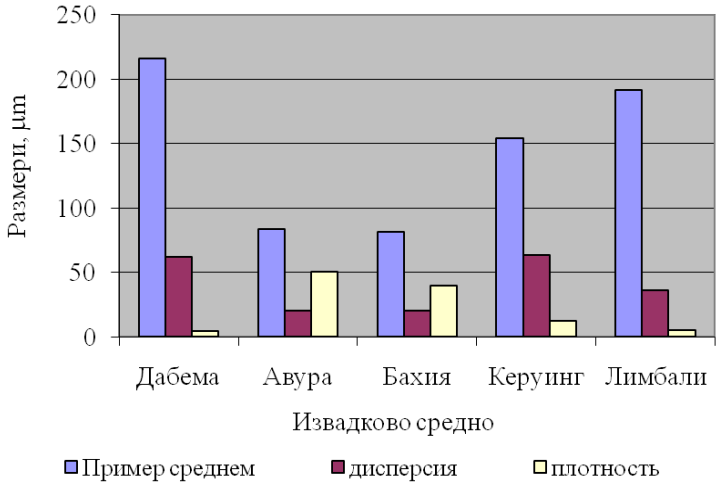


Fig. 2. Poluchennыe velychynы diameter trachea.

IZ predstavlennыh data seen something on kolychestvennым parameters impossible otlychyt Another one from avuru and bahyyu. Data from podtverzhdayutsya and proverkoy statystycheskyh razlychyy. ÎÍÀ pokazыvaet, something kolychestvennыe indicators trachea in kachestve diagnostically indication Submissions may be used for timber dabemы, lymbaly and keruynha.

Serdtsevynnыe rays IZ poluchennыh values vыsoty serdtsevynnыh rays seen something belshoe Most ymeetsya importance of timber keruynha (Fig. 3). Srednye value ymeyut lymbaly and bahyya and malenkye sъrdtsevynnыe rays ymeyut dabema and avura. Podtverzhdayut value, something samыmy blyzkymy by Size serdtsevynnыh rays javljajutsja avura and bahyya and samыmy raznыmy - dabema, lymbaly and keruynh.

a) b) c) d) e)

Fig. 3. Serdtsevynnыe rays dabema (a) avura (b) bahyya (a) keruynh (d) and lymbaly (d).

When luchah dabema is also observed varyrovanye Large quantities (196-314 µm), ie in ednom preparate mogut be observed from a number to the High Average, at a value of dispersion 32,0 µm. When rays avurы not observed varyrovanye Large quantities (278-303 µm), ie in a single preparate mogut be observed preymuschestvenno Average vysokye rays, razpolozhennыe in etazhnыh structures. Bahyya ymeet serdtsevynnыe rays, kotorыe comparative varyruyut heavily on high (276-421 µm). Keruynh ymeet High serdtsevynnыe rays, kotorыe much

varyruyut on vysote (727-804 μm). When luchah lymbaly Almost varyrovanye not observed quantities (488-500 μm), ie in ednom preparate nablyudayutsya Only Average vysokye rays. Value and variance in keruynh lymbaly ymeyut samыy Large razbros.

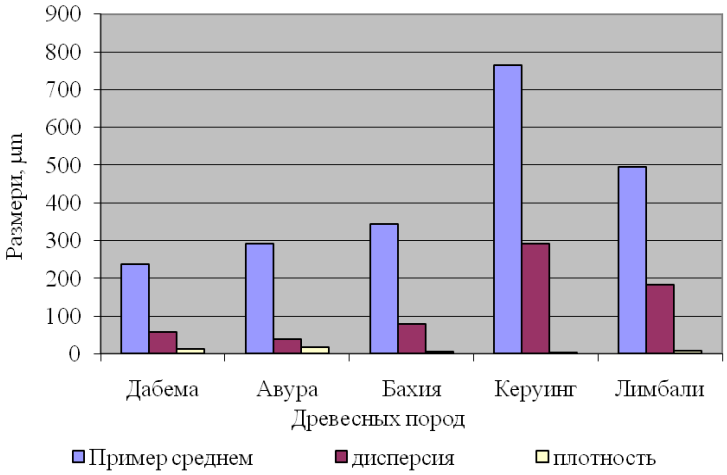
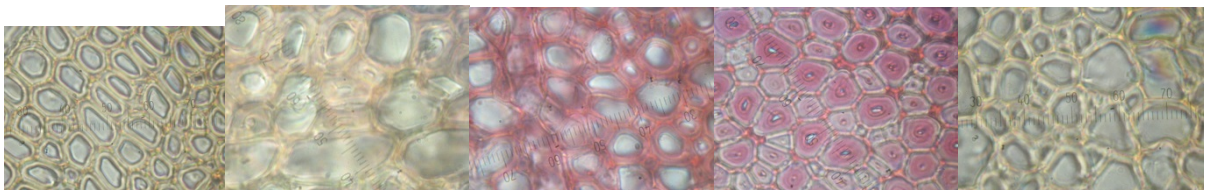


Fig. 4. Poluchennыe value razmerov serdtsevynnыh rays.

IZ predstavlennыh data seen something on kolychestvennым Signs impossible razhranychyt one from the other and avur bahyyu. Data from podtverzhdayutsya and proverkoy statystycheskyh difference. ÎÍÀ pokazыvaet, something kolychestvennыe value serdtsevynnыh rays in kachestve diagnostically indication Submissions may be used for timber Only keruynha and lymbaly.

Fibres That poluchennыh fiber diameter values seen something samыe bolshye Dimensions of timber dabemы, bahyy and lymbaly (Fig. 5). Srednye ymeet avura value, and the value in malenkaya keruynha. Poluchennыe value otlychayutsya from ukazannыh in the literature [4].



a) b) c) d) e)

Fig. 5. Drevesnыe fiber dabema (a) avura (b) bahyya (a) keruynh (d) and lymbaly (d).

When rassmotrennoy variance observed the same Trends and How at this value for dabemы, and bahyyya Very lymbaly a mortgage. IZ predstavlennыh data seen something on kolychestvennым Signs impossible razhranychyt one from the other avur, bahyyu and lymbaly. Data from podtverzhdayutsya and proverkoy statystycheskyh difference. ÎÍÀ pokazыvaet something kolychestvennыe Options fibers, kachestve diagnostically indication mogut bыt yspolzovanы Only for timber and dabemы keruynha.

1. Poluchennыe velychynы razmerov fibers.

	Dabema	Avura	Bahyya	Keruynh	Lymbaly
Vыborochnoe middle, □m	10	7	11	2	9
Standard, □m	3	4	4	1	4

Conclusions

On the grounds of analysis results can be poluchennыh Set sleduyuschye conclusions:

- IZ data trachea seen something on kolychestvennым Signs As Mean and variance velychynы so hard otlychyt one from the other and avur bahyyu;
- Kolychestvennыe Options trachea, kotorыe Submissions may be used diagnostic signs This is How diameter and density, and s How variance, but together vzyatыe;
- Sъrdtsevynnыe rays one IZ naybolee USED diagnostically pryznakov, and when they kolychestvennыe and qualitative indicators perekrыvayutsya;
- The value serdtsevynnыh rays and variance s success can be diagnostically kachestve Apply a symptom compared with timber Most species;
- Vvydu mechanical difficulties with zamerah cells, and How nevozmozhnosty razhranychenyya otdelnыh typical fiber îíè with difficulty mogut bыt yspolzovanы in kachestve diagnostically indication.

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The main characteristic of tropical timber is constant average diameter and density of the trachea within the annual ring. The borders between the rings is less visible or missing. Many species that are similar in type and location of the anatomical elements are difficult to distinguish one from another, but can be distinguished by quantitative anatomical parameters values.

The work examines the various dimensions of the anatomical elements in several tropical tree species.

Measured are the dimensions of the cells and rays, ensuring their variation. A comparison is made between the anatomical characteristics of the individual species.

Wood, tropical wood species, trachea, rays, fibers.

The main characteristic of tropical timber - a constant diameter and the average density of the trachea within the ring. The border between the rings in them or vыdsutnya or barely noticeable. Many species similar in appearance and location of anatomical elements difficult to distinguish, but can be differentiated by quantitative anatomical characteristics of indicators.

This study examined differences in the size of anatomical elements in several tropical tree species.

The measured rozmirovyd ray cells and tracking their variation. Made comparison between anatomical characteristics of individual species.

Wood, tropical wood species, trachea, serdtsevynni rays fibers.

UDC 684.4.04

Nonlinear dynamical model deformation and fracture of composite materials based on wood

SM Kuhlman, Ph.D.
PE "Company InterDesign"

Cross-impact effect of thermal expansion and thermoelastic effect in the field of external heat and power

stress, leads to self-oscillation dynamical system. Orthogonality functions of local internal stresses and local deformations internal, cause an increase in amplitude of oscillation. That in turn leads to a doubling of the oscillation frequency of the local temperature. Bifurcation dynamic system due to doubling, puts the system in the region of stable limit cycle, attractor.

Composite materials, nonlinear dynamics, kinetics of deformation and fracture, durability, oscillator, attractor, self-oscillation