De asemenea, în cazul utilizării metodei veniturilor, expertul folosește datele contabile, însă nu în toate cazurile documentația financiară corespunde realității, deoarece în majoritatea cazurilor agenții economici nu reflectă veniturile reale obținute din activitățile sale.

În opinia noastră, această stare de lucruri nu poate dura mult timp.

Este necesară elaborarea și aprobarea metodelor standard în expertiza judiciară în domeniul evaluării bunurilor imobile și modificarea legislația în vigoare. Acest lucru ar contribui nu numai la eliminarea lacunelor existente în activitatea de expertiză judiciară în domeniul evaluării bunurilor imobile și utilajului tehnologic, ci și la asigurarea sistemului judecătoresc cu concluzii de înaltă calitate, la nivelul contemporan.

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USING MOLECULAR NEAR INFRARED SPECTROSCOPYIN INVESTIGATION OF OFFENCES CONNECTED WITH ILLEGAL FORESTRY ACTIVITY

Anna KHOKH,
Head of the Laboratory of Materials, Substances andProductsResearches (Scientific and Practical Centre of The State Forensic Examination Committee of The Republic of Belarus
Vyacheslav ZVYAGINTSEV,
Head of the Departmentof Forest Protection and Wood Science, Ph.D. (Biology), Associate Professor
(Belarusian State Technological University)

Новым перспективным методом для решения экспертных задач, связанных с установлением места произрастания срубленной древесиныи подтверждением декларируемого места ее заготовки, является молекулярная спектроскопия в ближней инфракрасной области (NIRS). В работе представлены результаты проведенных экспериментальных исследований, а также указаны некоторые особенности дифференциации образцов древесины сосныобыкновенной различного географического происхожденияданным методом.

At the present time, the investigation of offenses related to illegal forest destruction has a number of obstacles. First of all, this is determined by the lack of scientifically based approaches to conducting expert studies, which are required both to check the compliance of a declared forest harvesting site and to properly identify illegally obtained wood.

As a promising direction for solving this problem, we can consider gathering information about the chemical composition of the wood. This is due to the fact that trees are able to record all environmental changes, as a result of which many of tree properties are directly related to the particular features and characteristics of a growing site [1]. At the same time, traditional methods such as, for example, inductively coupled plasma atomic emission spectroscopy or gas chromatography-mass spectrometry used for chemical analysis, are rather expensive and time-consuming. The method of near-infrared molecular spectroscopy (NIRS) may serve as an alternative method [2, 3]. This method allows researchers to determine many chemical components with a high degree of accuracy at a very low cost. Its main advantages are the non-destructive nature of measurements, the minimal preparation of samples, and the high speed of the analysis.

The use of NIRS technology for solving expert problems related to the identification of the growing site of the felled wood is based on the fact that the most functional groups of organic wood molecules possess their own characteristic vibrations, which have absorption bands in the certain regions of the spectra.

We have chosen a Scots pine (*Pinussilvestris* L.) as a study object. This tree is the most common forest-forming wood species in the Republic of Belarus and the most frequent object of environmental

offenses, which include violations of forest legislation.

The experiment have used dendrological material (drill cores) from 5 temporary sample plots founded in 2015-2016 on the territory of Grodno Region in the framework of the task 3.2.01 «The development of new approaches to the forensic investigation of objects of a vegetable origin» under the state program of scientific researches «Informatics, space and safety» (the sub-program «The scientific support of forensic activity and protection from emergencies»). It should be noted that the general standardized tree-ring chronologies obtained for these sample plots form one dendrochronologically homogeneous region, which cannot fully satisfy the interests of investigative and judicial practice, since experts daily try to restrict a group (territorial) identity and to determine the source of origin. These tasks can be successfully solved by gathering the information about the chemical composition of the wood.

Previously, the upper part 1-1.5 mm thick was being cut transversally off the drill cores with a pistol knife with a retractable trapezoidal blade until the maximally even plane without scratches and other flaws on the sample surface was formed.

The studies were conducted using a MicroNIR portable NIR spectrometer of the company «VIAVI». 20 consecutive measurements were performed for each sample. Further on, the measurements were been averaged. All the measurements were performed in a diffuse reflection mode, since the wood was a heterogeneous material with micro-cracks, vascular cavities, different curvature of annual growth layers, etc.

The classification model, which allows researchers to identify differences between the samples, was constructed using the method of the principal component in the software «The Unscrambler X» of the company «CAMO» [4]. As a result, five groups of samples are clearly visible in the score plot of the obtained model (by the number of examined temporary sample plots).

At the same time, the samples with temporary sample plots No 3-5 are located on the left side of the score plot, and the samples with temporary sample plots No 1-2 are on the right side. A graphic representation of the results is presented in the Figure 1.

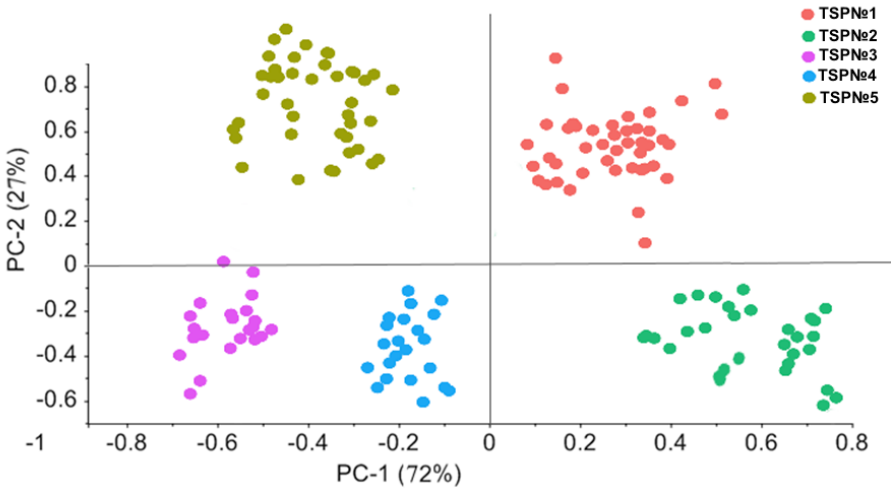

Fig. 1.–The score plot

It should be emphasized that the obtained samples with temporary sample plots No 1 and No 2 possess the maximum number of common characteristics, compared to the others. This phenomenon may be associated with a similar soil structure on these territories. Many authors mention that the correlation between the content of the active form of a chemical element in the soil and the saturation of a plant tissue with this element is usually positive and significant.

The verification of the classification model was performed using a cross-validation method. To do this, at first, one sample was withdrawn out of the total data set, and then the model was reconstructed with regard to its withdrawal. Afterwards, the sample entered the model again (it entered as a control one) and the difference between its initial position in the model and the position after withdrawal was calculated. In the course of the inspection, the origin of all the studied samples of the wood *Pinussilvestris* L. was correctly identified.

The main quality parameters of the constructed model are as follows:

1) the absence of gross errors (Hotelling's statistics);

2) the use of 100% useful information

All the diagnostic tests were successfully performed, on account of which the model can be considered adequate. In the future, its classification characteristics can be improved by adding a larger number of samples, as well as using additional methods for adjustment of the scattering.

Therefore, it can be stated that the method of near-infrared molecular spectroscopy, in combination with statistical methods for analyzing multifactorial dependencies, can be efficiently used to solve diagnostic expert problems related to the identification of the pine grow-

ing area of various geographical origins.

In some cases, using NIRS, it is possible to obtain unique information that cannot be obtained using other methods. However, one must bear in mind that a key requirement for the correct interpretation of the findings is the adequate preliminary processing of spectrometric data in combination with the statistical methods of a multifactorial analysis (factor and cluster analysis, identity verification, etc.).

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EXPERTIZAREA PROCESELOR TEHNOLOGICE – UNUL DIN OBIECTIVELE DE PERSPECTIVĂ ALE LABORATORULUI EJIT al CNEJ MJ RM

Anatolie LÂSÂI,
Centrul Naţional de Expertize Judiciare de pe lângă Ministerul Justiției, mun. Chișinău, R. Moldova

Progresul ştiinţei şi tehnicii şi extinderea relaţiilor umane potenţial generatoare de litigii a dus la extinderea experizei judiciare în aproape toate domeniile, inclusiv și în procesele tehnologice. Progresul ştiinţei și tehnicii contemporane determină și evoluția metodelor de cercetare și investigare, precum și a metodelor de soluţionare a problematicilor expertizelor judiciare inginero - tehnice.

În scopul alinierii activităţii de expertiză judiciară inginero – tehnică la evoluările forţelor de producție este necesar de a efectua expertiza judiciară a proceselor tehnologice.

În lucrarea de față este prezentată o comunicare referitoare la procesul tehnologic, componentele tehnologice de bază, obiectele, obiectivele și metodicile expertizei judiciare inginero – tehnologice, care urmează să fie elaborate și asimilate.

Cuvinte-cheie: *inginerie, tehnologie, componentele tehnologice, procese tehnologice, expertiza judiciară inginero – tehnologică.*

„EXPERT EVALUATION OF THE TECHNOLOGICAL PROCESSES – ONE OF THE OBJECTIVES OF THE ETJE OF NCJE MJ RM”

The scientific and technical progress and the development of the human relations, probable cause of litigations, have resulted in the extension of the judicial expertise in most of the areas, including technological processes. The contemporary scientific and technological progress have determined the evolution of the research and investigation methods and of the problem-solving methods of the engineering and technical judicial expertise.

In order to align the activity of the engineering and technical judicial expertise with the evolution of the productive forces, it is necessary to carry out the judicial expertise of the technological processes.

This article refers to the technological process, the main technological constituents, the objects, the objectives and the methodology of the engineering and technical judicial expertise,that are to be designed and assimilated.

Keywords*: engineering, technology, technological components, technological processes, engineering and technological expertise.*

Actualitatea temei. În ultima perioadă de timp, la dispunerea expertizelor care urmează a fi efectuate în laboratorul EJIT al CNEJ MJ RM, tot mai frecvent se pun spre soluționare întrebări care depășesc limitele obiectivelor genurilor de expertiză efectuate în laboratorul EJIT. Soluționarea unora dintre ele necesită examinarea unor tehnologii, mijloace de producere, articole, materiale și substanțe noi, care impun elaborarea unor metode și metodici noi de examinare.

În lucrarea de față este prezentată o comunicare referitoare la obiectul și obiectivele expertizei judiciare inginero – tehnologice în cadrul căreia pot fi soluționate întrebările ce se referă la examinarea proceselor tehnologice.

Constatări: O trăsătură principală a epocii contemporane este dezvoltarea vertiginoasă a științei și tehnicii, care provoacă transformări radicale în majoritatea sfere-