

# СУДЕБНО-БИОЛОГИЧЕСКОЕ ЗНАЧЕНИЕ ВОЗДЕЙСТВИЯ НА ПОТОВЫДЕЛЕНИЯ ДАКТО-ПОРОШКОВ, ИСПОЛЬЗУЕМЫЕ ЭКСПЕРТ-КРИМИНАЛИСТАМИ ОРГАНОВ ВНУТРЕННИХ ДЕЛ

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**Актуальность.** В настоящее время для установления отпечатков пальцев рук и идентификации человека в экспертно-криминалистической службе используются различные дакто-порошки, клейкие ленты-скотч, супер клей, аэрозоли в составе которых присутствует йод, нингидрин и другие химические вещества. Но в экспертизах с отрицательными результатами, для дальнейшей идентификации личности возникает вопрос о пригодности использованных отпечатков пальцев рук на различных предметах для проведения судебно-биологической экспертизы для установления наличия пота, группы выделений и проведения ДНК- исследований. В данной статье проведены результаты исследования влияния на пот различных химических веществ, используемых криминалистами на предметах с отпечатками пальцев рук.

**Ключевые слова:** *эксперт-криминалист, дакто-порошок, пот, отпечатки пальцев*

## ИЧКИ ИШЛАР ОРГАНЛАРИ ЭКСПЕРТ КРИМИНАЛИСТИКА ХИЗМАТИДА ФОЙДАЛАНИЛАДИГАН ДАКТО-КУКУНЛАРНИ ТЕР АЖРАТМАЛАРИ БИЛАН ЎЗАРО ТАЪСИРИНИ СУД-БИОЛОГИК АҲАМИЯТИ

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**Аннотация** Hozirda sud-tibbiyot xizmatida barmoq izlarini aniqlash va shaxsni aniqlash uchun turli dakto kukunlari, yopishqoq lentalar, super yelim, tarkibida yod, ningidrin va boshqa kimyoviy moddalar bo'lgan aerazolalar qo'llanilmoqda. Ammo salbiy natijalarga ega bo'lgan tekshiruvlarda, shaxsni keyingi identifikatsiyalash uchun, ter, sekretiya guruhi mavjudligini aniqlash va DNK tadqiqotlarini o'tkazish uchun sud-biologik ekspertiza uchun turli mavzularda qo'llanilgan barmoq izlarining mosligi haqida savol tug'iladi. Ushbu maqolada sud-tibbiyot ekspertlari tomonidan barmoq izlari bo'lgan narsalarga qo'llaniladigan turli xil kimyoviy moddalarning terga ta'sirini o'rganish natijalari keltirilgan.

**Калит сўзлар:** *sud-tibbiyot eksperti, dakto kukuni, ter, barmoq izlari.*

## FORENSIC BIOLOGICAL SIGNIFICANCE OF THE IMPACT ON THE SWEAT PRODUCTION OF DACTO POWDERS USED BY FORENSIC EXPERTS OF THE INTERNAL AFFAIRS BODIES

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**Annotation.** Currently, to establish fingerprints and identify a person in the forensic service, various dactto powders, adhesive tapes, super glue, aerosols containing iodine, ninhydrin and other chemicals are used. But in examinations with negative results, for further identification of a person, the question arises of the suitability of the used fingerprints on various subjects for forensic biological examination to establish the presence of sweat, a group of secretions and conduct DNA studies. This article presents the results of a study of the effect on sweat of various chemicals used by forensic scientists on objects with fingerprints.

**Keywords:** *forensic expert, dactto powder, sweat, fingerprints.*

**Relevance of the topic:** In the course of investigative actions, the practice of identification of the person by fingerprints left by unknown persons on the physical evidence-items found at the scene of the incident by forensic experts of internal affairs agencies is important. For this purpose, expert criminologists use many methods to obtain fingerprints left on bodies. For example, dakto-powders with different composition, sticky "scotch", "super glue", spray liquids containing ninhydrin, iodine and other substances are among them. However, in cases where fingerprints are not found on the items or these items are not suitable for digital inspection, it is necessary to conduct forensic biological examinations in order to determine the presence of sweat and other biological secretions related to humans. Or, in some controversial cases that arise during the investigation, it is necessary to determine the appropriateness of the preliminary examinations to be carried out by experts in the field - a forensic expert or a forensic expert, in order to obtain a positive result from the bodies found at the scene of the incident. Consequently, reducing the negative consequences of the interaction of dakto-powders and other substances with sweat secretions and other biological secretions (blood, saliva) used in the process of criminalistic examination of objects on the results of the examination is of great importance in conducting the investigation processes in an objective and complete way.

**Inspection objects:** In our research, there are 4 wooden and plastic handle knives, 2 wooden handle axes, 1 wooden pickaxe, 1 wooden handle rake, 4 metal door handles, 2 white and black aluminum window frame handles, 2 rubber and 2 artificial leather-covered car steering wheel surfaces were used.

**Methods of inspection:** Tests are used in the forensic biology department and approved in 2020 about "Determining the presence of sweat by serine, threonine, valine and leucine amino acids by chromatography method on silofol plate" ABY.D.158.2013 – carried out according to the instructions for the execution of the numerical operation.

**Composition of human sweat secretion**  
The composition of human sweat is a complex variable,

which varies depending on various endogenous and exogenous factors. The reaction of sweat secretion is weakly acidic to alkaline. Sweat contains sodium, potassium, calcium, magnesium, copper, manganese, iron, chlorides, iodides, sulfates, and phosphates. 97-99% of sweat secretions are made up of water. Organic substances include: protein (traces), lipids, urea, creatine, creatinine, uric acid, aromatic acids, cholesterol, sugar, etc. Sweat contains all 20 different amino acids, the most abundant of which is the amino acid serine. Amylase and ascorbic acid are enzymes. Morphological elements: epidermal cells and skin cells, crystals (urea, cholesterol, etc.), microorganisms, and oil droplets are present in small amounts. Currently, two methods are used to identify fingerprints at the crime scene by the expert forensic service of internal affairs bodies. The first is a physical method, in which powders are sprinkled on the surface, taking into account the surface level (horizontal, vertical) and the nature of the powder, the excess is knocked off, cleaned using a simple and magnetic cyst (use of spraying equipment for large surface surfaces). Powders must be very fine, dry, and different from the color of the surface to be traced. When the examined surface is treated with powder, the oily secretion that separates from the human body and reflects the fingerprint on the surface of the object attracts the powder particles and a fingerprint appears on the surface. When the resulting fingerprint is cleaned with a simple and magnetic brush, its special features are better expressed. The trace is then copied onto tape. The second is a chemical method, which is used to detect marks on porcelain, earthenware, tiles, light-colored plastics, nickel-plated objects and polished metals, and ninhydrin liquid to detect marks on walls, paper and plywood. Processed traces are photographed using a ring (extension ring) with artificial light.

To get high-quality traces from the wall surface iodine vapor is used. In this case, iodine crystals placed in a test tube are vaporized by heating, and the steam is sprayed onto the wall surface through a rubber tube and a sprayer. As a result, a fingerprint on the surface of the wall will attract iodine vapor, resulting in a

fingerprint or palm print on the wall. It is recommended to quickly capture the resulting handprint using an extension ring. Because, after 1-2 minutes, the resulting handprint will disappear again due to the evaporation of iodine. Often, written letters, threatening letters, or money bills are taken as evidence from the crime scene to distract the investigation (these items also contain sweat and oil secretions when they are handled by hand and are important in the process of forensic biological examination). In this case, a 3% solution of ninhydrin in acetone is used to obtain fingerprints from evidence (100 grams of acetone is mixed with 3 grams of ninhydrin). A piece of paper or money is moistened with the prepared solution, and then dried. As a result of drying, fingerprints on paper and banknotes appear dark-pink.

A solution of silver nitrate (lyapis) is used to remove marks from unpainted or unvarnished wooden objects (Solution composition: silver nitrate 5 g, citric acid 1 g, tartaric acid 0.5 g, nitric acid 3-5 drops, distilled water 100 cubic centimeters). The prepared solution is stored in a darkened container, as it loses its properties under the influence of light. With this solution, the wooden surface to be traced is wetted using a clean brush. After some time (up to 2 hours) the marks start to appear black.

Powders used in fingerprinting:

1. Malachite. 2. Soot 3. Zinc oxide. 4. Sapphire. 5. Topaz. 6. Ruby. 7. Aluminum powder. 8. Iodine vapor. When choosing the tools used to identify traces in the practice of expert forensics, it is necessary to take into account the time of these traces' appearance. Faintly visible and invisible skin-oil marks can be detected with any type of powder before about 30 hours, which appeared in a relatively short period of time, because during this period they do not undergo significant changes. As a result of the effects of the atmosphere, the moisture contained in the skin-fat traces is lost in the traces that have been formed for about 6 days. Therefore, the use of heavy metal powders in their detection gives good results. If the time for the formation of traces is too long, the moisture in it evaporates, and as a result, the traces are covered with crystals of inorganic substances, which makes their identification difficult. Because of this, powdery substances are almost useless for identifying "old" traces. In such cases, it is necessary to add adhesive substances to the powders. Also, for the purpose of identifying "old" traces, it is necessary to artificially moisten the objects with traces, increasing the humidity can be done at the expense of steam baths or vapors coming out of the human mouth. Trace detection at the expense of additional moisture can give better results.

**In the detection and extraction of handprints from various surfaces applied powders SCHEDULE**

Items to be sampled	Name of powders
Glass and glass containers	Aluminum powder, oxide-zinc, plaster, lead powder, manganese powder
Porcelain, faience, tile plate	Rosin copper powder, bronze powder, graphite
Black painted metal	Aluminum powder, rosin copper powder, lead powder
Nickel-plated and polished metal	Bronze powder, rosin copper powder, lead powder
Light colored metal	Graphite, resin
The plastic	Aluminum powder, oxide-zinc, graphite, manganese dust
Plywood, timber	Graphite, resin, rosin, copper ore
Paper, cardboard	Lead powder, graphite, resin, copper powder, lead powder, iron powder, ninhydrin solution
Varnished rubber	Oxide-zinc, lead powder, manganese powder
Unlacquered rubber	Oxide-zinc, red lead
The surface of the fruit	Copper ore, lead powder, copper ore with confetti
Polished, painted, lacquered wood	Oxide-zinc, lead powder, manganese powder
Leather, kirza, dermontin	Lead oxide, zinc oxide

Currently, a new method is used to detect "old" traces, that is, the object to be tested is placed in a thermostat pre-soaked with "super glue". After forming a thin layer on the surface with glue vapors, the exposed fingerprints are scanned. But if a negative result is obtained from such processed objects, it becomes unfit for forensic biological examination.

**The results of the experiment:** during the inspection, 2 plastic-handled knives, 2 rubber and 2 leather-covered car steering wheels, and 2 metal door handles were treated with red magnetic powder (ruby).. A white magnetic powder (PBM-MP) 1 piece of bita and 2 pieces of ax handle were processed. Coal (carbon black) 4 pieces of knives with wooden handle and 2 pieces of plastic handle, 2 pieces of metal door handles, 2 pieces of white aluminum window frame handles were processed with. Black Magnetic Powder (PBM-4) with 2 black aluminum window handles and 1 grab bar. A 3% solution of ninhydrin in acetone was used to treat sweat secretions left on banknotes and pieces of paper. For examinations, the left sweat extracts were taken at intervals of up to 1 month (1 day, 3 days, 6 days, 12 days and 30 days). Coal (carbon black) in all subjects treated with Rf, important Rf: serine-0.23, threonine-0.33, valine-0.4, and leucine-0.53 amino acids in sweat secretions left for up to 12 days. showed well, and by 30 days it had faded a little. Red Magnetic Powder (Ruby), White Magnetic Powder (PMW-PM) and black magnetic powder (PBM-4) The slides taken from all the permedates treated with sulfon were placed in a universal solution (4:1:2 ratio of butanol, acetic acid, distilled water) on a cellophane plate to a distance of 3 cm from the starting point of the solvent (the plate is equal to 15 cm), as a result of which all amino acids (serine, threonine, valine, leucine) formed a single pink spot and was equal to Rf-0.9. Such results were observed equally in subjects from 1 day to 30 days. In our opinion, inorganic substances contained in the composition of sweat separator and magnetic powder have a negative effect on their rise above the start through the universal solution of silufol on the plate. Banknotes and scraps of paper were treated with a

3% solution of ninhydrin in acetone and heated (100 degrees), direct sweat secretions appeared. When slides were removed from these subjects and examined on a cellophane plate without the use of a universal solution, serine amino acid-specific zones were also observed.

**The conclusion:** coal in our experience (carbon black) A positive result was obtained in the subjects treated with the primary treatment and then examined for sweat secretion. Treatment of objects with red, white and black magnetic powders had a negative effect on the appearance of sweat secretions in all examinations. After all, in order to reduce the effect of these powders, the expert must clean the surface of the objects used in criminalistics from the remaining powders with a dry brush (braush, molar brush) and then take a sample for biological tests. It is also important how long after the accident the investigations were carried out to identify the traces. Therefore, the probability of obtaining a positive result for fingerprints in expert criminal investigations is very high within 1 day to 10-20 days. Since more negative results are obtained at higher periods, when samples are taken for forensic biological examinations and sweat secretions are found in them, additional - Deoxyribonucleic acid it would be appropriate to conduct an examination. Charcoal on the surface of the object to identify fingerprints in expert forensic investigations (carbon black) regardless of whether a positive or negative result is obtained when treated with, if these items are subjected to additional forensic biological tests, the probability of identifying evidence will be higher.

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