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Characterisation of the papillary structure of the nasolabial mirror of cats

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Abstract. The relevance of this study is due to the need for scientifically sound, accurate and non-invasive methods of identification of domestic animals, in particular cats, in veterinary and forensic veterinary practice. Existing methods of identification (chipping, tagging, ournics) have a number of disadvantages – possibility of loss, painful procedure or allergic reactions. This increases the importance of finding alternative solutions. The aim of the work was to morphologically analyse the papillary structure of the nasolabial mirror of cats (*Felis catus*) and to scientifically substantiate its use as a unique identification trait of an animal. The following methods were applied during the study: taking prints using Trodat 9052 stamp pad and paper, scanning images of prints, digital processing using CorelDraw 2017 and Adobe Photoshop programs, as well as comparative morphological analysis of the obtained data. The nasolabial mirrors of 157 cats were examined, including repeated imprinting in 14 individuals after a certain time interval. It was found that papillary patterns of the nasolabial mirror have three stable morphological properties: individuality (uniqueness of the pattern in each individual), invariability (they are preserved during life) and ability to regenerate (restoration of the pattern in the absence of destruction of the microbial layer of the skin). Additionally, it was found that the obtained prints can serve as objective material for identification of the animal during veterinary examination, registration, forensic examination or in conditions of loss. The results have shown the possibility of developing a biometric system of accounting of pets based on the analysis of papillary structures of the nose. The practical significance of the study lies in the application of the results in veterinary clinics, forensic examination, customs authorities and in the creation of a unified database of domestic animals

Keywords: animal dermatoglyphics; papillary patterns of *Felis catus*; individual identification; morphological analysis; biometric veterinary medicine; forensic veterinary expertise

Introduction

Domestic cats have accompanied humans for thousands of years, fulfilling not only utilitarian but also emotional functions. They help control rodent populations, are used in zootherapy, and act as companions in both urban and rural settings. Modern realities – urbanisation, increasing numbers of stray animals, increased

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migration of pets between regions and countries – require an increased level of animal control and record keeping, especially in situations of loss, theft or epizootic risk. This in turn necessitates the development of accurate and ethically acceptable identification methods (Yatsenko *et al*., 2025).

A variety of animal identification methods are used in veterinary practice, including tattooing, tagging, microchipping and DNA passporting. However, each has its limitations. For example, microchips require scanning devices, can cause allergic reactions and sometimes migrate under the animal's skin. Therefore, there is a need to develop alternative approaches that are both accurate, safe, cost-effective and versatile (Singh *et al*., 2024). As noted by S. Spotkay & L. Lykhina (2019), one of the promising directions in animal identification is the use of dermatoglyphic traits, in particular papillary patterns on the nasolabial mirror. These patterns, like fingerprints in humans, are unique and virtually unchanging throughout the animal's life. Unlike invasive identification methods, this method does not require surgery, making it convenient and painless for pets and professionals alike (Meng *et al*., 2025).

Modern research confirms the biometric potential of papillary structures. In particular, G. Kimani *et al*. (2023) investigated the possibility of identifying dogs and cats by nose and paw prints, creating prototypes of biometric databases. The authors noted the high stability of nose prints in cats and suggested their use as a permanent identification marker. V. Immonen *et al*. (2023) proposed the application of computer vision and machine learning techniques to analyse nasolabial mirror images. Their results showed that such algorithms can achieve accuracy comparable to microchipping methods, provided that image acquisition techniques are standardised. In a study by W. Andrew *et al*. (2021), morphological features of facial structures of domestic animals were examined. The authors concluded that papillary structures in cats persist over time and do not change significantly even in adulthood, making them a particularly reliable identification feature.

In parallel to the technical aspects of biometrics, A. Shafiev *et al*. (2023) have drawn attention to the regulatory and ethical aspects of implementing biometric methods in animal records. Electronic registries incorporating biometric data are already being implemented in EU countries, including to combat uncontrolled breeding and animal cruelty. A. Hitelman *et al*. (2022) reviewed the potential use of dermatoglyphics in veterinary forensics. They emphasise that, similar to human fingerprinting, morphological features of the nasal surface can be adapted to the needs of forensic veterinary science, especially in cases involving the identification of animals in epizootics or ownership disputes. An experimental study by M. Stennett *et al*. (2022) confirmed that digital imaging of nasolabial mirror prints using scanners and their subsequent processing in graphic editors can achieve highly reproducible results. Particularly interesting is the fact that even with partial tissue damage in animals the possibility of identification is preserved due to the uniqueness of the preserved areas of the pattern. Also worth noting is the work of A. Kaur *et al*. (2022), which analyses identification methods in natural disasters. The authors suggest using visual biometric traits, including nasal prints, as a complement to microchips, especially in cases where electronic devices are non-functional.

Thus, a review of the current scientific literature indicates a high scientific and practical interest in the development of animal identification methods based on dermatoglyphic traits. Despite the many theoretical and empirical publications, most of the research has focused on dogs, cattle and wild animals, note S. Li *et al*. (2021). Studies focusing specifically on cats, especially in terms of papillary regeneration and resistance to trauma, are extremely limited. In addition, to date, there are no standardised protocols for taking and analysing prints from domestic cats. The need for reliable identification of animals is increasing not only in veterinary practice, but also in forensic veterinary examination, forensic science, customs control and databases. The development of a non-invasive method based on nasolabial morphology can significantly improve the accuracy and availability of identification procedures (Li *et al*., 2022).

An important feature of the approach proposed in this article is its accessibility and ease of implementation in both veterinary clinic and field settings. As noted by P. Cihan *et al*. (2024), nasolabial mirror prints can be obtained using inexpensive materials – stamp pad, paper and scanning device. In addition, the ability to digitally process images using standard graphic editors allows rapid and accurate comparison of prints between individuals. Taking into account the high degree of individuality of the papillary pattern, stability of its shape during the animal's life and ability to partial regeneration, this method can be recommended as a basis for the development of a national system of biometric registration of domestic cats. This is particularly relevant in the context of creating a unified electronic database containing visual identifiers to track the origin, affiliation and epidemiological status of animals. The aim of the present study was to perform morphological analysis of the papillary structure of the nasolabial mirror of cats and to evaluate the possibility of its application as a biometric identification trait.

Materials and Methods

The study was conducted from May to December 2023 at the Department of Histology and Pathology, Faculty of Veterinary Medicine and Biotechnology, K.I. Skryabin Kyrgyz National Agrarian University (Bishkek), with the participation of private veterinary clinics and pet owners. Nasolabial mirror prints of 157 cats, including

both pedigreed and mongrel individuals of different ages and sexes, were used as material. To study pattern stability, repeat prints were obtained from 14 cats after 2 to 6 months. The material was collected with the voluntary consent of the animal owners. All procedures were performed without the use of anaesthesia and were painless. The animals did not experience discomfort, as the method of fingerprinting is completely non-invasive. The study was performed in compliance with the generally accepted ethical standards governing work with animals in veterinary morphology (Directive 2010/63/EU, 2010).

The methodology was based on a modified dermatoglyphic analysis technique adapted to the anatomo-physiological features of cats. A Trodat 9052 stamp pad with hypoallergenic, non-irritating ink was used for taking prints. The surface of the nasolabial mirror was pressed against a clean sheet of paper on a hard surface, after which the resulting prints were dried and scanned using a Canon 3010 multifunctional device. The digitised images were processed in CorelDraw 2017 graphics software where pattern tracing, contour extraction and contrast enhancement were performed. Additionally, the tools of scaling, overlay and mirror comparison were used, which allowed morphological assessment of three main properties: individuality – absence of repeating patterns even in close relatives; invariability – stability of the papillary pattern over time; ability to regenerate – partial restoration of the pattern after damage.

Each print was digitally archived and compared with the results of repeated surveys, which allowed us to draw conclusions about the stability and reproducibility of traits, as described in Yu. Malofeev & S. Ermakova (2006). Possible technical errors related to lighting, position of the animal's head and humidity of the nasal surface were taken into account in the analyses. The information base of the study included both original experimental data and comparative data from scientific publications on dermatoglyphics in domestic animals, including the works of S. Samishchenko (2003), J. Frewein & B. Vollmerhaus (2003) and others. The applied approach allowed us to objectively confirm the suitability of papillary structures of the nasolabial mirror of cats for reliable visual identification of animals in veterinary, forensic and forensic practice.

Results and Discussion

In the course of the study it was found that the surface of the nasolabial mirror in cats is a unique anatomical zone in terms of microrelief, which can fulfil the identification function. The morphology of the papillary pattern of each individual had clear individual features, which is confirmed by visual analysis of the obtained images. Comparison of prints and photographs revealed pronounced differences in the shape, location and configuration of papillary pattern areas between different animals, indicating a high degree of individuality of this structure. Figure 1 demonstrates the visual differences between the two cats: the first image shows a grouped pattern with larger tubercles and asymmetrical areas, whereas the second image shows a more even distribution and finely dispersed structure. Both images were obtained under the same illumination and scale, emphasising the objectivity of the differences.

Figure 1. Nasolabial mirror surface of two different cats with a characteristic papillary pattern
Source: photo by the authors

The obtained images of the nasolabial mirror confirmed a high degree of individuality of the papillary pattern in each studied cat. As in human dactyloscopy, these patterns represent a unique morphological configuration that is not repeated in other individuals. This fact was confirmed by a comparative analysis of the prints of all 157 cats: no coincidences between the patterns were recorded, including animals of the same age and breed. The anatomical structure of the nasolabial mirror in cats includes rough skin devoid of hair covering, forming numerous areolae and micro tubercles, which remain in a relatively stable position during the animal's life. This structure is described in I. Tuminaite & R. Kröger (2020), where it is stated that the nasal planum is subdivided into polygonal areas with a clear boundary, forming an individual pattern.

According to the morphological analysis data, the nasal surface represents an identification area suitable for visual comparison and archiving in digital format. The obtained images were brought to a uniform scale, processed in a graphic editor, and then compared with control prints. Despite minor external differences in brightness and contrast, the pattern structure remained clear and reproducible. To improve the accuracy

of identification, an animal record card was introduced, including a photograph or nasolabial mirror print, as well as information about the animal: nickname, age, sex, breed, colour, date and place of image acquisition, and owner data (Fig. 2a). This approach allows not only instant identification, but also the use of this data in further – during passportisation, veterinary surveillance, registration or tracing of lost animals.

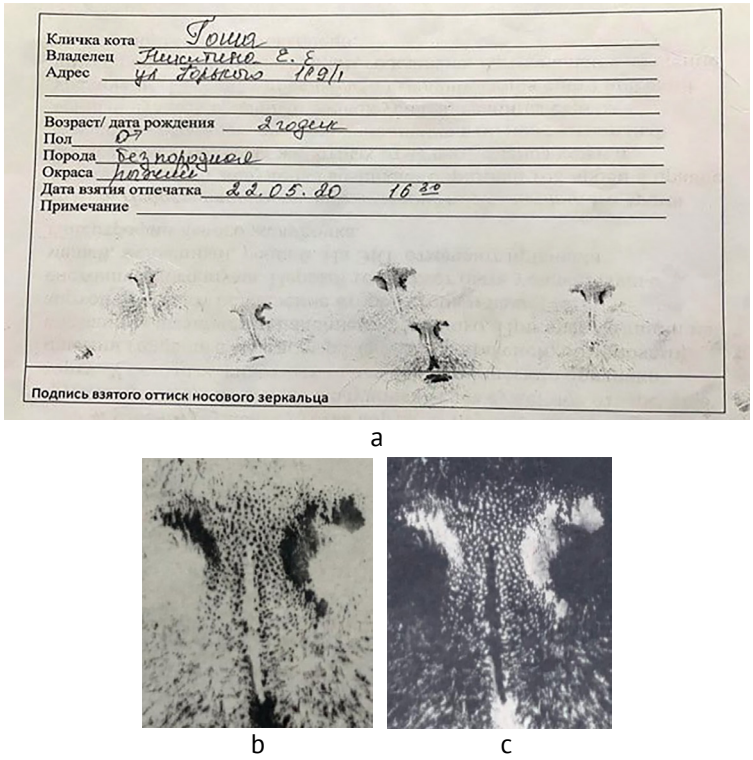

Figure 2. Example of an identification card and digital print of the nasolabial mirror of a cat named Gosha
Note: sex – male, age – 2 years, imprint date – 22.05.2020
Source: image prepared by the authors based on field survey data and computer processing CorelDraw 2017

To assess the individuality and graphic stability of the papillary pattern in cats, several typical images were selected. The nasolabial print of a cat named Gosha, who was 2 years old at the time of imaging, is presented as an example. The analysis was carried out in two stages: first, the resulting print was captured with a camera, then converted into a digital graphic format and subjected to computer processing. The visual results are presented in Figure 2. Figure 2b shows the primary image of the print captured using the camera. The photograph was taken in daylight, focusing on the centre of the nasolabial mirror. Figure 2c is the same print processed in the CorelDraw 2017 graphic editor, converted to negative format, which allowed to enhance the visibility of microrelief and highlight key elements of the pattern. This approach is used to facilitate the comparison of prints during re-identification. Thus, the combination of imaging and digital processing methods ensures that the structure of the nasolabial mirror can be clearly reproduced and confirms the presence of a unique pattern in each animal. The use of the Trodat 9052 ink stamp and paper allows the prints to be obtained painlessly and without side effects, making the method applicable in practical veterinary medicine. This image can be used to identify animals and serve as a document for further use in forensic examinations. As can be seen in Figure 2, the authors obtained the image without any changes when they put the tracing into a computer programme.

To assess the stability of the papillary pattern over time, the prints of a 2-year-old male cat named Timofey were taken again. The primary print was taken on 11.09.2022 using a camera and then digitally processed. Figure 3 illustrates the visual differences between the original and negative images of the same print. This allowed the structure of the papillary elements to be observed in detail. Figure 3a shows the original print produced using Trodat 9052 ink pad and paper, without digital processing. The image shows the basic microrelief of the surface of the nasolabial mirror. Figure 3b shows the same print after digitisation and colour inversion in CorelDraw 2017 graphics software. This processing allows the visualisation of individual areolae and micro-bumps, making it possible to more accurately match areas when re-imaging. Both images confirm the stability and reproducibility of the pattern. Minor differences are only due to the nature of the illumination and the angle of acquisition, and not to changes in the structure itself.

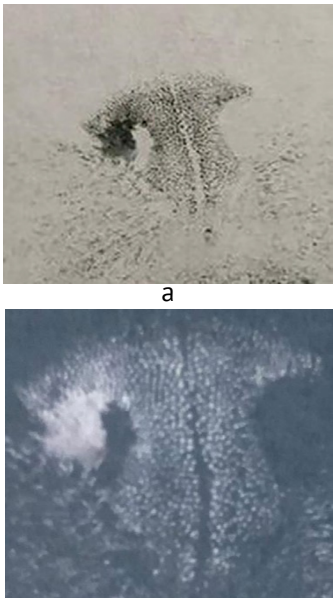

Figure 3. Nasolabial mirror of a cat named Timofey
Note: age – 2 years, male, nose print was obtained on 11.09.2022; a – original print; b – digital image in negative format
Source: photo by the authors

Figures 4a and 4b show a nose print of a cat named Musya, which was taken with a camera. The image was then loaded into the CorelDraw 2017 graphics programme on a computer and converted to negative format (Fig. 4b). In this way, using a Trodat 9052 stamp and paper, an image of the animal's nose and lip print can be produced.

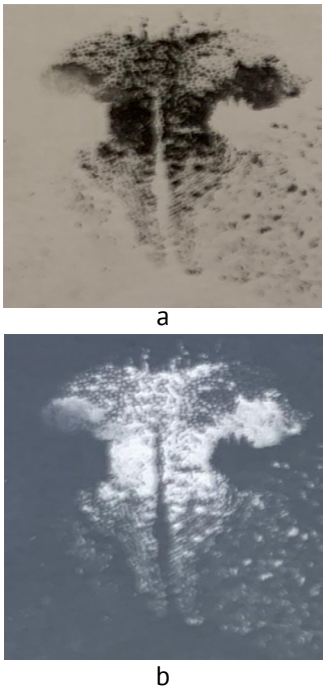

Figure 4. Nose print of a cat named Musya
Note: age – 7-8 months, female, nose print was obtained on 23.05.2022
Source: photo by the authors

Figures 5a and 5b show the nose print of a cat named Marquise, which was taken with a camera. The image was then loaded into the CorelDraw 2017 graphics programme on a computer and converted to negative format (Fig. 5b). Exposure of the nasal mirror of cats, in general, may have some similarity in characteristics that are determined by breed characteristics and a particular shape of the nasal mirror, but details or features of the pattern can vary considerably even among members of the same breed and between parents and their offspring.

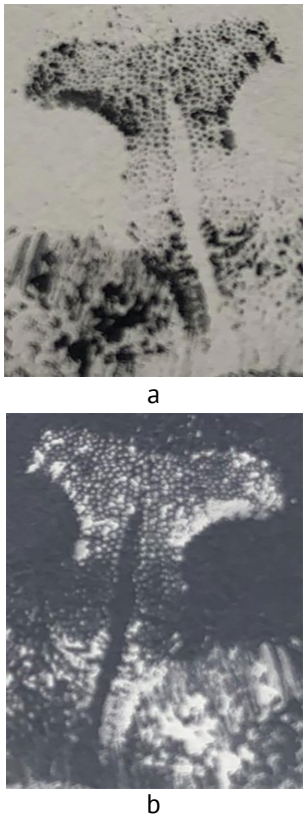

Figure 5. Nose print of a cat named Marquise
Note: age – 7-8 months, female, nose print was obtained on 23.05.2022
Source: photo by the authors

The comparative analysis of papillary patterns in related individuals demonstrated pronounced differences in the configuration of structures, even in the presence of common genetic features. Figure 6 shows digital images of the nasolabial mirrors of two animals: an adult male (father) and his offspring (son). The prints were taken using the same technique, allowing the images to be compared at an identical scale. Figure 6a shows the nasolabial mirror print of the parental individual. It is characterised by a high density of papillary elements in the central zone and symmetrically arranged lateral areolae. Figure 6b shows the imprint of the progeny. Despite the general similar contour of the external pattern, differences in microstructure are clearly visible in the details: a different shape of the areolae, their distribution and the expression of the central furrow.

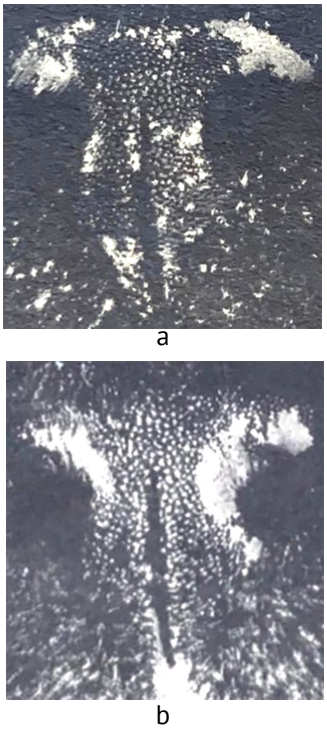

Figure 6. Nasolabial mirror of two cats
Note: a – father's picture; b – son's picture
Source: photo by the authors

Thus, the first property of papillary patterns is individuality: each pattern is unique, even among closely related animals. This property makes the method suitable for reliable identification in the practice of veterinary morphology. Additionally, based on observations of 14 individuals with repeated fingerprinting, it was found that the configuration of papillary elements remains stable. With the growth of the animal, a uniform increase in the area of the pattern is observed, but the structure and arrangement of the areolae do not change. This fact confirms the second key property – invariability of the papillary pattern over time.

The comparative analysis performed on the basis of nasolabial mirror prints obtained with a time interval allowed us to assess the stability and dynamics of the papillary pattern in cats. Figure 7 shows two images obtained from a cat named Fedot (date of birth – 02.02.2018). The first print was taken on 05.08.2020 and the second print was taken on 22.07.2021. Both images contain red markings indicating key structural elements comparable between the two time points. Figure 7a reflects the state of the pattern in 2020, Figure 7b almost a year later. Visual analysis shows that despite the natural age-related changes in the animal, the geometry and distribution of the papillary areolae remained stable, confirming the second fundamental property, the relative invariability of the pattern over time.

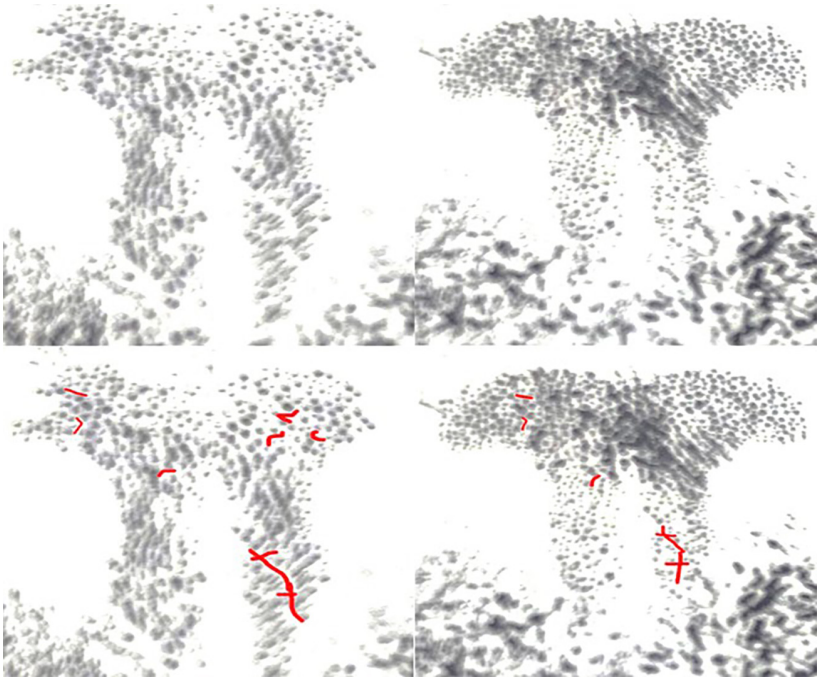

Figure 7. Nose print of a cat named Fedot
Note: date of birth – 02.02.2018; first print made on 05.08.2020, second print made on 22.07.2021
Source: photo by the authors

Figure 8 shows a pair of images taken from a cat named Boris (date of birth – 10.04.2019). The first print was taken on 05.03.2021 and the second on 07.07.2022. Similarly, the drawings were supplemented with visual markers (red lines) emphasising identical elements in the structure. Despite possible microtrauma or environmental exposure, the images show no signs of pattern degradation.

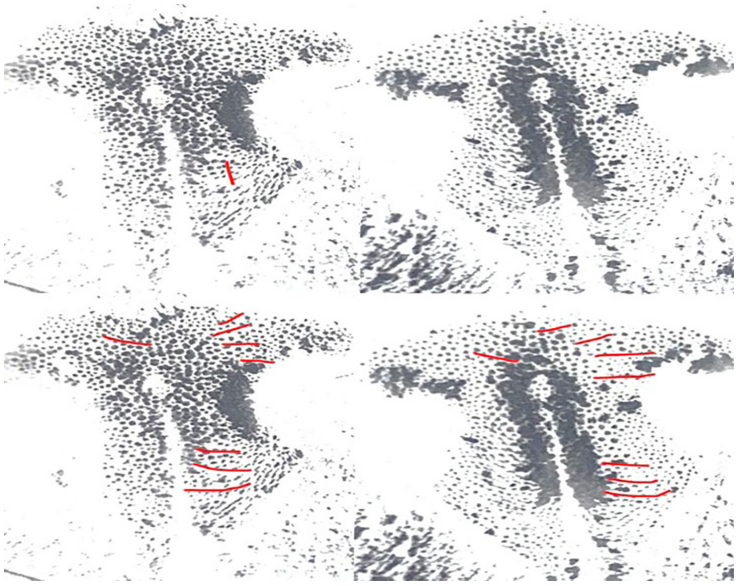

Figure 8. Nose print of a cat named Boris
Note: date of birth – 10.04.2019; first print made on 05.03.2021, second print made on 07.07.2022
Source: photo by the authors

The observation confirms that the papillary pattern retains its key characteristics throughout the animal's life. Cases of partial recovery of the pattern after superficial damage have also been recorded. This indicates the ability to regenerate, similar to that described in human fingerprinting studies: if the basal layer of the skin is preserved, regeneration is possible and identification features are reproducible (Samishchenko, 2003). The study found that papillary structures on the nasolabial mirror of cats have unique morphological characteristics suitable for use in biometric identification of animals. The dermatoglyphic patterns of the nasal surface in each individual have an individual character, similar to fingerprints in humans, as written by J. Frewein & B. Vollmerhaus (2003). Similar structures, previously studied mainly on the skin of limbs, have proven their suitability also on the nasal speculum of animals, including their possible application in sanitary-veterinary and forensic examination (Samishchenko, 2003). In the context of the development of animal visual biometrics, research shows the potential for automatic recognition of individuals based on unique natural patterns in wild animals (tigers, zebras, jaguars) using deep neural networks, which is consistent with the search for new non-invasive identification methods (Cheema & Anand, 2020). The results of this work also echo research on biometric identification of domestic animals, such as dogs, where deep neural networks are actively used to improve recognition accuracy and the possibility of combining "hard" (e.g., muzzle photos) and "soft" (breed, sex) biometric data in integrated systems is being explored (Lai *et al.*, 2020). Such an approach to non-invasive visual biometric identification is already showing high potential in the livestock industry, where, for example, highly accurate systems have been developed to recognise cattle from unique muzzle patterns, offering an effective replacement for traditional methods and contributing to improved welfare and herd management, as described in A. Shojaeipour *et al.* (2021).

In the present work, the analysis of 14 repeated prints obtained from different animals with a time interval confirmed that the configuration of papillary pattern elements remains stable. During the growth of the animal, there was only a proportional increase in the area of the pattern, without changes in the geometry of polyhedral areas. This allows us to speak about the invariability of the structural organisation of the pattern during the cat's life, like fingerprints in humans (Ponomarev, 2016; Spotkay, 2019). Additionally, the prints of two cats with traumatic damage to the nose were analysed. The results showed that in superficial lesions that do not affect the microbial (basal) layer of the skin, there is a partial restoration of the original pattern. In cases of deeper lesions, scarring changes are formed, accompanied by distortion of the pattern in the damaged area. However, in adjacent undamaged areas, the structure is preserved, which makes it possible to continue identification.

Thus, three key properties of the papillary structures of the nasolabial mirror of cats can be identified based on the analysis performed:

- Individuality: each animal has a unique papillary pattern that is not repeated even in closely related individuals. This property allows the nasolabial mirror to be used as a reliable biometric identifier;
- Immutability: the structure of the papillary pattern remains unchanged throughout the animal's life. With age, the areolae can only increase in size without

disturbing their shape and arrangement. This ensures the reliability of the method for long-term follow-up;

- Ability to regenerate: papillary skin structures have the ability to partially recover from damage if the basal layer is preserved. Even if scarring is present in one area, adjacent areas remain stable and identifiable.

The listed properties confirm the high suitability of using papillary patterns of the nasolabial mirror of cats in veterinary forensics, biometric registration and forensic veterinary identification. The results obtained can serve as a basis for the development of standard procedures for capturing, archiving and analysing prints within a unified pet registration system.

Conclusions

In the course of the study, it was found that papillary patterns of the nasolabial mirror of cats have distinct morphological features that have not been previously subjected to systematic scientific study. The analysis allowed for identifying three key properties determining high identification value of these structures: individuality (each cat specimen has a unique papillary pattern that is not repeated even in related individuals, which makes accurate biometric identification possible); relative invariability (papillary structures remain unchanged throughout the animal's life – with age, only a harmonious increase in the size of areolae without loss of structural organisation is possible); ability to regenerate the papillary pattern of the nasolabial mirror of the cat; and the ability to be used as a tool for the identification of the nasolabial mirror of cats.

The data obtained indicate the high suitability of papillary structures of the nasolabial mirror for application in forensic veterinary medicine, customs examination, forensics and in the creation of biometric animal registration systems. The technique of capturing and analysing prints can be used for reliable identification of animals in case of their loss, movement or the need to document their ownership. Prospects for further research include improvement of methods for digital fingerprint processing and development of automatic recognition systems, as well as extension of the technique to other animal species within the framework of biological defence and veterinary registration.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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Мышыктардын насолабиалдык күзгүсүнүн папиллярдык түзүлүшүнүн мүнөздөмөсү

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Аннотация. Бул изилдөөнүн актуалдуулугу ветеринардык жана соттук ветеринардык практикада үй жаныбарларын, атап айтканда мышыктарды идентификациялоонун илимий жактан негизделген, так жана инвазивдүү эмес методдоруна муктаждык менен шартталган. Идентификациялоонун учурдагы ыкмалары (чиптөө, биркалоо, нашейниктер) бир катар кемчиликтерге ээ – процедуранын жоголушу, оорушу же аллергиялык реакциялар. Бул альтернативдүү чечимдерди табуунун маанилүүлүгүн жогорулатат. Иштин максаты мышыктардын назолабиалдык күзгүсүнүн папиллярдык түзүлүшүн морфологиялык талдоодо жана аны жаныбардын кайталангыс идентификациялык белгиси катары пайдаланууунун илимий негиздемесинде турат. Изилдөө процессинде төмөнкүдөй методдор колдонулган: Тстк 9052 штемпелдик жаздыктын жана кагаздын жардамы менен издерди алуу, издердин сүрөттөрүн сканерлөө, Сток 2017 жана Ттп программаларын колдонуу менен санариптик иштетүү, ошондой эле алынган маалыматтарды салыштырмалуу морфологиялык талдоо. 157 мышыктын насолабиалдык күзгүлөрү изилденген, анын ичинде белгилүү бир убакыт аралыгында 14 адамда кайра басылган. Мурун-Эрин күзгүсүнүн папиллярдык оймо-чиймелери үч туруктуу морфологиялык касиетке ээ экендиги аныкталды: индивидуалдуулук (ар бир индивиддеги үлгүнүн уникалдуулугу), өзгөрүлбөстүк (өмүр бою сакталат) жана регенерация жөндөмдүүлүгү (теринин микробдук катмары бузулбаган учурда үлгүнү калыбына келтирүү). Алынган издер ветеринардык кароодо, каттоодо, соттук экспертизада же дайынсыз жоголгон шартта жаныбарды идентификациялоо үчүн объективдүү материал катары кызмат кыла алары кошумча аныкталган. Натыйжалар мурундун папиллярдык структураларын талдоонун негизинде үй жаныбарларын эсепке алуунун биометрикалык системасын иштеп чыгуу мүмкүнчүлүгүн көрсөтөт. Изилдөөнүн практикалык мааниси ветеринардык клиникаларда, соттук экспертизада, бажы органдарында жана үй жаныбарларынын бирдиктүү маалымат базасын түзүүдө жыйынтыктарды колдонууда турат

Негизги сөздөр: жаныбарлардын дерматоглификасы; папиллярдык оймо-чиймелер; Жеке идентификация; морфологиялык анализ; биометрикалык ветеринария; соттук-ветеринардык экспертиза

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Аннотация. Актуальность настоящего исследования обусловлена потребностью в научно обоснованных, точных и неинвазивных методах идентификации домашних животных, в частности кошек, в ветеринарной и судебно-ветеринарной практике. Существующие методы идентификации (чипирование, биркование, нашейники) имеют ряд недостатков – возможность утери, болезненность процедуры или аллергические реакции. Это повышает значимость поиска альтернативных решений. Цель работы заключалась в морфологическом анализе папиллярного строения носогубного зеркала кошек (*Felis catus*) и в научном обосновании его использования как уникального идентификационного признака животного. В процессе исследования были применены следующие методы: снятие отпечатков с помощью штемпельной подушки Trodat 9052 и бумаги, сканирование изображений отпечатков, цифровая обработка с применением программ CorelDraw 2017 и Adobe Photoshop, а также сравнительный морфологический анализ полученных данных. Были исследованы носогубные зеркала 157 кошек, в том числе с повторным снятием отпечатков у 14 особей через определенный временной интервал. Установлено, что папиллярные узоры носогубного зеркала обладают тремя стабильными морфологическими свойствами: индивидуальностью (уникальность узора у каждой особи), неизменностью (сохраняются в течение жизни) и способностью к регенерации (восстановление узора при отсутствии разрушения микробного слоя кожи). Дополнительно установлено, что полученные отпечатки могут служить объективным материалом для идентификации животного при ветеринарном осмотре, регистрации, судмедэкспертизе или в условиях пропажи. Результаты показали возможность разработки биометрической системы учета домашних животных на основе анализа папиллярных структур носа. Практическая значимость исследования заключается в применении результатов в ветеринарных клиниках, судебной экспертизе, таможенных органах и при создании единой базы данных домашних животных

Ключевые слова: дерматоглифика животных; папиллярные узоры *Felis catus*; индивидуальная идентификация; морфологический анализ; биометрическая ветеринария; судебно-ветеринарная экспертиза