

## METHODOLOGICAL CONSIDERATIONS ON THE DACTYLOSCOPIC ANALYSIS PERFORMED ON AN ANTHROPOMORPHIC STATUETTE FROM THE CUCUTENI A-B PHASE\*

Adela Kovács\*\*

*Keywords: dactyloscopy, ceramic, anthropomorphic statuette, microscopy, Cucuteni culture*  
*Cuvinte cheie: dactiloscopie, ceramică, statueta antropomorfă, microscopie, Cultura Cucuteni*

(Abstract)

Even if forensics and archaeology are separate sciences, they have in common a methodology for searching and discovering the traces, as a result of human activities carried out in the past. An archaeological fingerprint on a single object can reveal four aspects: it provides a sign of an individual's identity; it indicates when the individual was alive; it indicates the geographical area in which the individual lived; it indicates the action performed by a person, such as writing a text, sealing an object, having a specific job etc. The collection, storage and comparative use of data, preferably from the entire area of the Cucuteni culture, could reveal more details about the man behind the artefact. As for fingerprints that can be corroborated with other historical sources, they can provide information about the role, occupation, or authority of individuals within society, or they can provide information about the duration of individual activities. The anthropomorphic statuette we are discussing in the present study comes from the Cucuteni A-B phase site in Ripiceni-Holm, Botoșani County, Romania and has a small imprint on the left knee. We framed that imprint typologically, observed it and discuss the limits and possibilities of analysis of the imprints within the Cucuteni culture.

The research of archaeological fingerprints is, in our opinion, a fascinating subject, primarily due to the information contained in the clay. The clay encrypts information about prehistoric people and can bring new data advancing the knowledge of their society. The identification of the person using the impressions on the papillary ridges of the epidermis has been studied for more than a century<sup>1</sup>. The technique is widely used in a number of e-business and e-government applications around the world, nowadays becoming even unique keys to secure doors, safes, computers, applications or smart gadgets. The traditional acquisition of fingerprint images was done by rolling or pressing the fingers on a hard surface, such as glass or polymers<sup>2</sup>. Nowadays, technology allows 3D fingerprint scanning, without direct contact with any surface<sup>3</sup>.

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\*\* Muzeul Județean Botoșani, str. Unirii nr. 15, Botoșani, jud. Botoșani, adelakovacs.museum@gmail.com

<sup>1</sup> Barnes 2010; Berry – Stoney 2001, 15–53.

<sup>2</sup> Kumar 2018, V.

<sup>3</sup> Wang *et alii* 2010, 592–600.

An imprint of the human body has a unique property, namely, it keeps an absolute proof on a certain person through a series of possible characteristics: the shape of the digital papillae, the size of the palmar area, the size of the foot, etc. and on certain types of materials (resins, colored materials, ceramics)<sup>4</sup>.

Botoșani County Museum holds numerous lots of archaeological material, from various historical and prehistoric periods. Some of the ceramic materials contain traces of the fingers and palms of prehistoric potters. Both by the quality of the ceramics and by the originality of the painted decoration, the Ariușd-Cucuteni-Trypillia civilization surpasses the artistic manifestations of the contemporary civilizations. This article aims to present from a dactyloscopic perspective an anthropomorphic statuette that comes from the Cucuteni A-B phase site of Ripiceni-Holm.

<sup>4</sup> Králík *et alii* 2008, 4.



Fig. 1. Locuința 2 din 2012 de la Ripiceni-Holm (Boghian et alii 2012, p. 204–205, fig. 5) / Dwelling 2 from 2012 discovered at Ripiceni-Holm (Boghian et alii 2012, p. 204–205, fig. 5)

*The anthropomorphic statuette:  
context and origin*

The site from Ripiceni-Holm is located in the northeastern part of the village Ripiceni Noi, on the right bank of the Prut (today the Stâncă-Costești Reservoir) and is one of the richest areas of archaeological heritage in Romania. The remains identified so far cover a wide period of time, from the Paleolithic to the Medieval and Modern periods.

The research at the Ripiceni-Holm/La Telescu site started in 2010 and, based on the archaeological materials discovered, it was included in phase A-B of the Cucuteni culture. The statuette analyzed in this study comes from Dwelling L2/2012<sup>5</sup>.

Dwelling L2/2012 was discovered in the NNE part of Box I, continuing towards NE, in the unexcavated part, occupied by the country road that crosses the site (Fig. 1). The house had a length of approx. 8 m and a width of approx. 5 m, with the long axis on the NW-SE direction. It was

partially deepened, with two rooms. The floor had portions of platform, which were approx. 0.40 m below the Cucuteni level of walking. The walls and the ceiling were made on a relatively massive wooden skeleton, the adobe layer having a thickness of 4–5 cm. The research team from 2012, coordinated by prof. Hab. Dumitru Boghian did not rule out in the preliminary report the possibility that this construction had an upper storey. In the southern corner of the house were identified the pits of some pillars, most likely inserted in the foundation ditches. Among the internal arrangements, the building had a hearth that was found disturbed (V2/2012)<sup>6</sup>.

*Paleodermatoglyph analysis methodology*

For the study of this statuette, as well as other archaeological materials in the deposits of the Botoșani County Museum<sup>7</sup>, we referred to a series of methodological studies that substantiated the analysis system of prehistoric dactyloscopic traces.

<sup>5</sup> Boghian et alii 2013, 204–205.

<sup>6</sup> Boghian et alii 2013, 204–205.

<sup>7</sup> Kovács – Melinte 2021, 7–36.

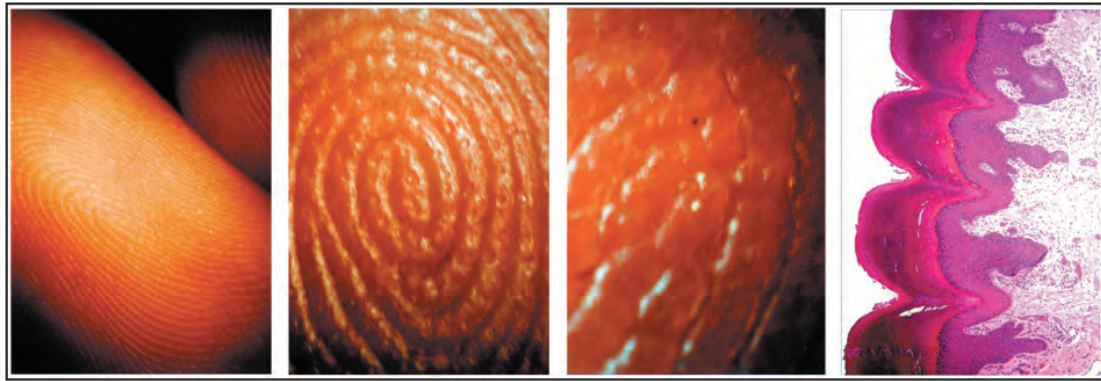


Fig. 2. Structura ampreței pe factori de mărire și secțiune histologică (Králík – Nejman 2007, p. 5, fig. 1) / Fingerprint structure by magnification factors and histological section (Králík – Nejman 2007, p. 5, fig. 1)

Archaeological fingerprints have also been called “paleodermatoglyphs”, a word composed of two elements that practically define the concept of ancient fingerprint. The ridges of the epidermis and their design, respectively dermatoglyphs, traces of skin friction, papillary terrain, all show a number of properties that can highlight the individual characteristics of prehistoric man (Fig. 2)<sup>8</sup>.

The extraction of the individual identification elements is carried out in three stages: 1-orientation and estimation of the field, 2-extraction of the ridges, 3-extraction of the minutiae and

post-processing. First, the orientation of the ridge is estimated and the region of interest is located. Subsequently, the ridges are extracted from the added image, refined to get rid of small spots, holes and thin lines, to obtain eight ridges connected to a single pixel (Fig. 3).

Finally, the minutiae are extracted from the thin and refined ridges using some image processing software. The resolution of the fingerprint images when scanning must be at least 500 dpi, this being the resolution recommended by the FBI for the automatic identification of fingerprints<sup>9</sup>.

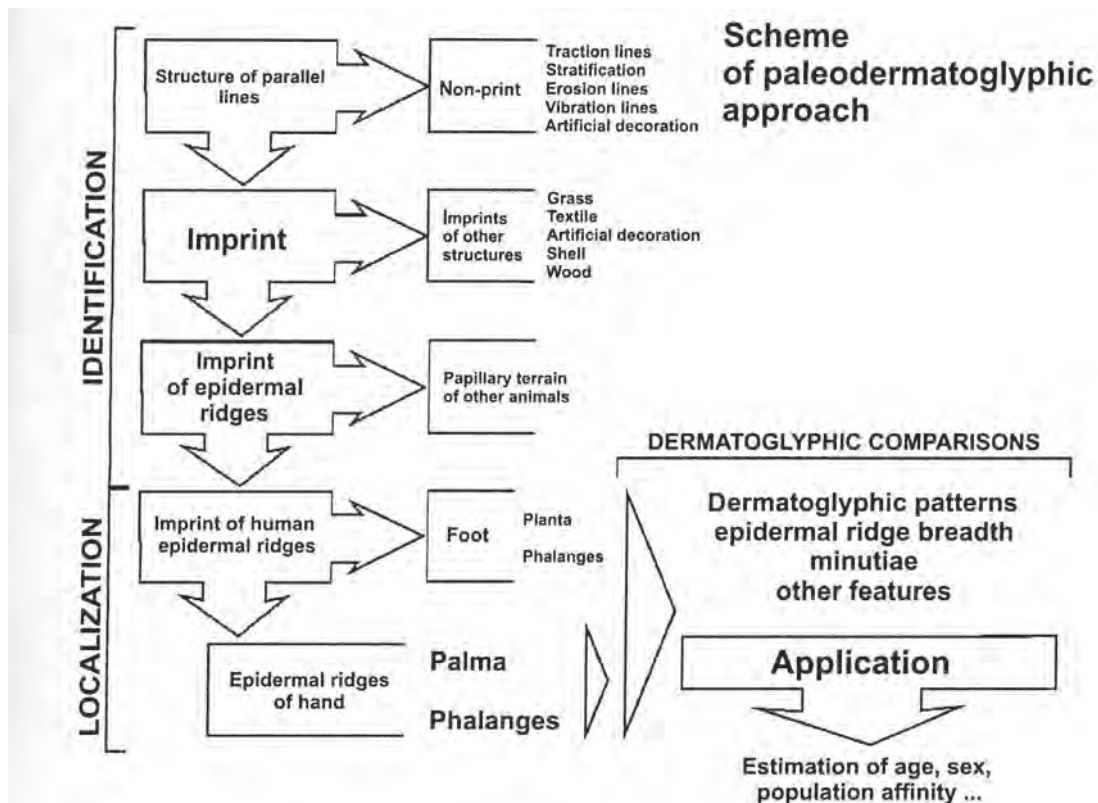


Fig. 3. Schema de abordare a paleodermatoglifelor (Králík – Novotný 2005, p. 451, fig. 1) / Paleodermatoglyphs approach scheme (Králík – Novotný 2005, p. 451, fig. 1)

<sup>8</sup> Králík – Novotný 2005, 449.

<sup>9</sup> Jain – Pankanti 2001, 305.

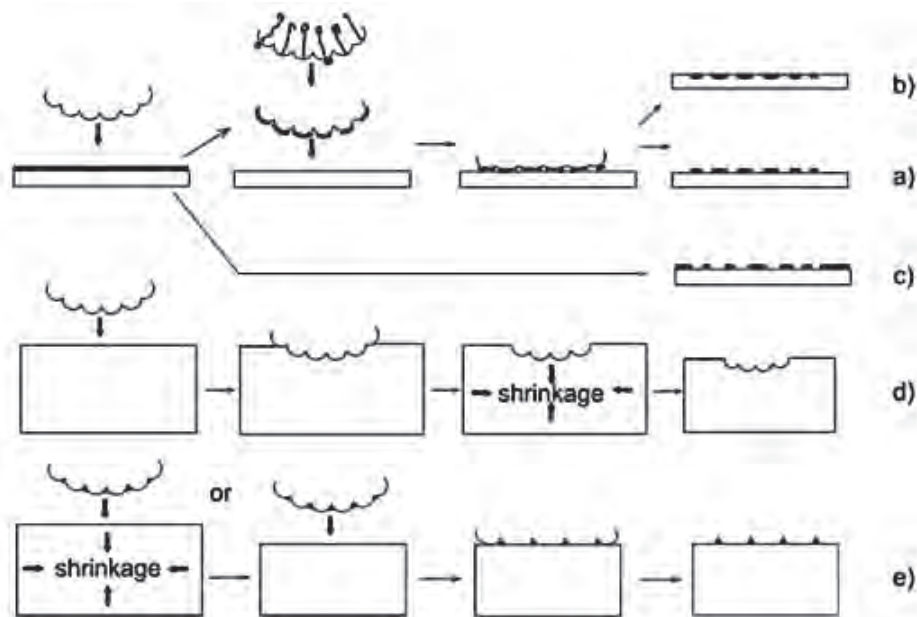


Fig. 4. Principiul formării amprentei pe diferite medii: a. amprentă bidimensională a unui deget scufundat într-un colorant pe suprafața unui obiect; b. variantă de absorbție a coloranților (în amprente latente de transpirație) într-un mediu de transfer bidimensional, precum hârtia; c. amprentă formată prin extragerea colorantului dintr-un strat proaspăt; d. amprentă presată în material cu proprietăți plastice; e. amprentă imprimare pe ceramică și compresia acesteia (Králík – Nejman 2007, p. 6, fig. 6) / The principle of fingerprint formation on different media: a. bi-dimensional fingerprint of a finger immersed in a dye on the surface of an object; b. variant of absorption of dyes (in latent traces of perspiration) in a bi-dimensional transfer medium, such as paper; c. imprint formed by extracting the dye from a fresh layer; d. imprint pressed in a material with plastic properties; e. fingerprint printing on ceramic and its compression (Králík – Nejman 2007, p. 6, fig. 6)

In the first stage we identified the dactyloscopic traces on the ceramic fragments. Only later did we go through the identification stage. It should be noted that for the present research we have dealt strictly with traces on ceramics, although other transfer media are quite adequate and can transmit ancient dactyloscopic information (Fig. 4). This type of material has adequate qualities to act as a medium for recording and transmitting fingerprints, being plastic enough for imprinting. Due to the way the ceramic is modeled, theoretically, any ceramic object could have been in contact with the human hand, becoming a potential medium for the transfer of fingerprints. As a result of the physical processes of drying and burning, the ceramic material becomes hard and chemically stable, which allows any imprint on the surfaces to be preserved for a long time.

The formation of a fingerprint on a ceramic object depends on the production technology. Fingerprints are preserved differently, depending on different technology and production, including on: statuettes, common vessels, tiles, bricks<sup>10</sup>.

The preservation of fingerprints also depends on the superficial changes of the vessels, their

smoothing and polishing having a negative influence on the preservation of fingerprints. Sometimes traces are preserved under layers of paint or glazes on the surfaces. Post-depositing processes can significantly affect the preservation of fingerprints, with major differences from case to case, depending on the medium of deposit and the duration of exposure. In the case of Cucuteni culture, the presence of calcium carbonate film on the surfaces led to the preservation of fingerprints in good condition.

Fingerprints can be classified as two-dimensional and three-dimensional. There are also transient fingerprints. For example, the impression can be partly three-dimensional and partly two-dimensional, depending on the thickness of the adherent paint and the degree of pressing on the ceramic support. All fingerprints are negatives of the original papillary drawing and deformed by pressure in the case of the pressed ones<sup>11</sup>.

Depending on the curvature of the ceramic fragment, fingerprints can be classified as: concave (usually imprinted by the finger on a curved surface), flat fingerprints – when copying the surface of the artifact, and convex fingerprints. Depending

<sup>10</sup> Einwögerer 2000, 121–133.

<sup>11</sup> Králík – Nejman 2007, 5.

on the method of generating the relief of the papillary ridges, on the ceramics there are fingerprints of the imprint type (formed in a plastic medium in which the epidermis is imprinted in the soft but non-adhesive material – therefore a softer material than the finger); additive fingerprint (this is formed by the adhesion of the less viscous ceramic material from the surface of the epidermis to the surface of the ceramic artifact) (Fig. 4).

The additive fingerprints are formed on the lower, outside areas of the ceramic vessels, when the vessel is grabbed by the base with a wet hand. The visibility of the papillary ridges is directly related to the granulation of the material. The finer the granulation, the more visible the fingerprint; the larger the granulation, the more the fingerprint can disappear in the structure. The pores are difficult to distinguish on ceramic support, being more visible on wax artifacts, corroded copper, architectural elements. Physico-chemical processes can change the appearance and size of the impressions. In the case of analysis of fingerprints on ceramic fragments, the shrinkage of the clay during the drying and firing process must be taken into account. In the case of ceramic fragments that undergo secondary firing, they often suffer from deformations so intense that fingerprints can become unrecognizable. In the same way, an inadequate firing can lead to the abrasion of the external layers and in this way the fingerprints are irreparably damaged. It must be emphasized, however, that there is no fingerprint on ceramics that has not suffered deformations<sup>12</sup>.

As for the intention of the one leaving the fingerprint, they are classified as intentional fingerprints (often the manufacturer's signature) and unintentional or accidental fingerprints (made unconsciously, with no intention of passing on the information). Most unintentional fingerprints are small and fragmentary, but even in this case certain identifications can be made by experienced researchers, based on the characteristic patterns of papillary ridges. As a result of grasping an object, the fingers leave the marks of the fingertips. During modeling the whole palm is involved in the movement and the chances of finding more data increase<sup>13</sup>.

Regarding the archaeological pottery, we can methodologically conclude the following relevant aspects. The process of forming fingerprints is done when the clay is soft. Most of the time, ceramic imprints are three-dimensional, but

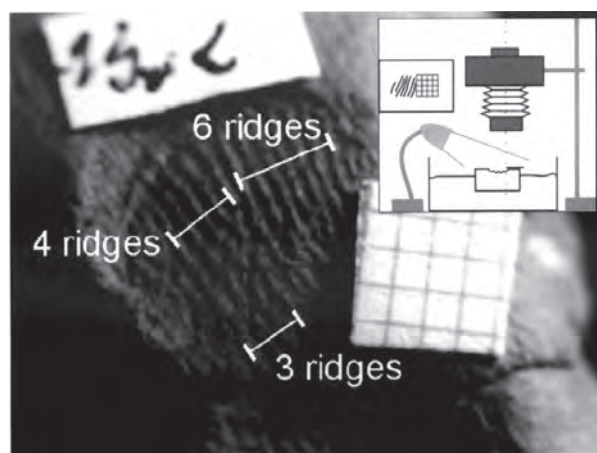


Fig. 5. *Prezentarea modului de fotografiere a amprentelor de pe fragmentele ceramice, poziția aparatului de fotografiat și a luminii în cadrul documentării* (Králík – Novotný 2005, 455, fig. 5) / *Presentation of how to photograph fingerprints on ceramic fragments, the position of the camera and the light during documentation* (Králík – Novotný 2005, 455, fig. 5)

two-dimensional ones can appear in the case of civilizations with painted ceramics. The imprint is influenced by the quality of the clay, the dimensions of the degreaser used (sand, pebbles, crushed shards, vegetal elements), the change in volume during the manufacturing process. Certain changes may occur along the way, after the actual making of the pottery, such as friction, fragmentation or damage by chemical processes that erase the trace. Regarding the assignment of the imprint, it can be associated either with the potter – the one who makes the item, or with a potter's apprentice, assisting in the manufacturing process. Rarely can be identified on the ceramic support those who use the vessel or ceramic item. In many cases, fingerprints have been identified on the base of vessels as a result of their handling. In this way, many identical fingerprints can be identified, so the similarity index between fingerprints would be large, but not very varied. The disadvantages presented by the dactyloscopic analysis take into account the fact that the fingerprints are anonymous, often small in size, possibly deformed as a result of the chemical processes caused by secondary firing<sup>14</sup>.

Having the theoretical framework of analysis well established, we moved to the second stage, namely image sampling (Fig. 5). Even if we did not identify a clear methodology for taking fingerprints from the ceramic fragments, Mikael Jägerbrand brought some clarifications and we considered to follow these indications. This was the main guide in terms of shooting and identification

<sup>12</sup> Králík – Nejman 2007, 9.

<sup>13</sup> Králík – Nejman 2007, 10.

<sup>14</sup> Králík – Nejman 2007, p. 12, table 1.

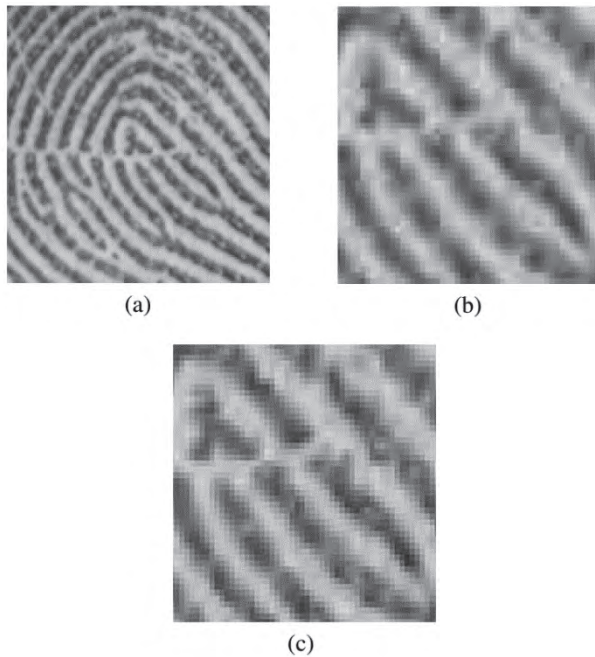


Fig. 6. a. Imaginea necomprimată; b. o porțiune din imaginea a într-o comprimare generică de algoritm Jpeg; c. porțiune din imaginea a, folosind scalarul quantisation (Jain – Pankanti 2001, 294, fig. 8.3) / Uncompressed image; b. a portion of image a in a generic Jpeg algorithm tablet; c. portion of image a, using the quantization scalar (Jain – Pankanti 2001, 294, fig. 8.3)

methodology. Theoretically, the identification of fingerprints should begin in the field, during archaeological research. The archaeologist must look for fingerprints when he removes the artifacts from the ground, because the search for a certain ceramic fragment, among others resulting from the excavation, is an extremely time consuming activity. It is extremely important that, regardless of the support material of the fingerprint, these fragments, which have been observed to be special, should be recorded separately. Individualization is a unique technique for forensic science and refers to the demonstration that a particular sample is unique, even among members of the same class. The term identification is sometimes used to mean personal identification (individualization of persons)<sup>15</sup>. In the case of the Cucuteni Culture research, this concept cannot be applied, because the calcium carbonate film prevents direct observation of the ceramic fragments and their surfaces. Calcium carbonate is removed in the laboratory by chemical methods.

Each fingerprint observed must be numbered. This is then photographed with a comparison

<sup>15</sup> Berry – Stoney 2001, 58.

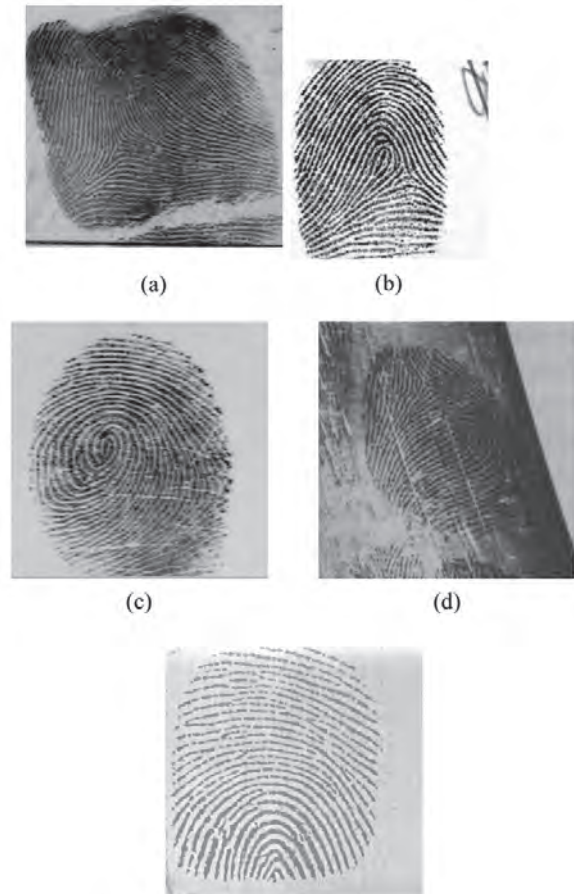


Fig. 7. Compararea diferitelor impresiuni: a. rotire prin cerneală; b. un deget care a fost atins de cerneală; c. imaginea scanată a degetului; d. o amprentă latentă; e. amprentă prelevată prin senzor stabil (Jain – Pankanti 2001, 295, fig. 8.4) / Comparison of different impressions: a. rotation in ink; b. a finger that has been touched by ink; c. the scanned image of the finger; d. latent imprint; e. fingerprint taken with fixed sensor (Jain – Pankanti 2001, 295, fig. 8.4)

scale next to it, the most methodologically indicated being a millimetric one. It is essential that the photo is taken perfectly perpendicular to the fingerprint to avoid the distortion caused by the lens. The higher the image resolution, the better the quality of the details. If the image is a high resolution one, it can even show details about the pores that form the papillary lines. They are smaller than 0.1 mm. When shooting multiple ceramic fragments, it is extremely important to number or name alphanumerically each object/fragment separately, because sometimes they are very similar visually. Each fingerprint must be documented with at least 4–5 images, indicating certain magnifications on the papillary drawing. Some images must show the artifact in its entirety, along with the arrows that indicate precisely the places where

the fingerprints were detected. The arrows used by police forensics are 60 mm long<sup>16</sup>.

Identification and individualization are processes common to several sciences, but for this case we opted for a macroscopic identification in the first phase. After selection and shooting under a microscope, a program to extract the unique identification elements should bring to light the ends of the ridges and the bifurcations of the papillary ridges. If the ridges are located centrally in the image, the extraction of the minutiae is relatively simple, extracting single points from a simplified dactyloscopic map. In archaeology this performance can rarely be achieved, the extraction of minutiae being directly dependent on the degree of preservation of the impression. There are other disruptive factors, such as aberrant formations of epidermal ridges, postnatal traces, occupational markings, sampling defects<sup>17</sup>. (In this case, we used Adobe Photoshop to represent the lines of the papillary ridges, for a framing as accurate as possible).

The detection of the ridges is performed by applying successive filters and determining a repetitiveness algorithm. Approaches for detecting ridges are made by using thresholds that determine the number of pixels on each image, by performing constant or variable thresholds. These approaches do not work on images with background noise or low contrast images (Fig. 6–7). Thin ridges facilitate the detection of minutiae. Before applying a thinning algorithm, false structures (e.g., dirt) detected as ridges must be removed<sup>18</sup>.

The Conventional Method is one of the earliest and safest methods of demonstrating fingerprints. The identification is based on the characteristics of the papillary ridges and the degree of similarity between them (Fig. 8). The analysis relationship involves taking into account the spatial positioning of all ridges and indicators inside the pattern, not just the spatial positioning of some features. This method of analysis requires considerable experience to understand exactly the congruence patterns of the elements<sup>19</sup>.

We chose the method proposed by Miroslav Králík and his collaborators. He has conducted some of the latest research on archaeological artifacts, on various transfer materials and of several types. He has compiled a statistical graph that

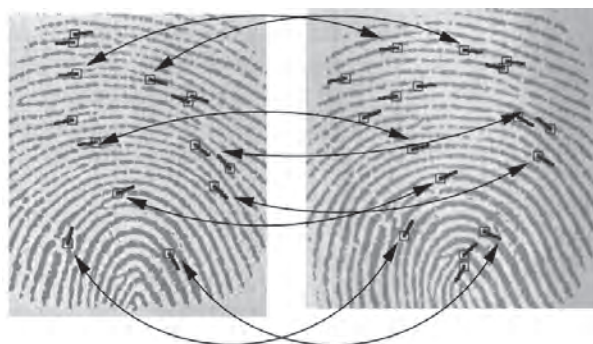


Fig. 8. Metoda de comparare a minuțiilor: marcarea bifurcațiilor și a capetelor de creastă între două imagini (Jain – Pankanti 2001, 304, fig. 8.10) / Method of comparing minutiae: marking bifurcations and ridge ends between two images (Jain – Pankanti 2001, 304, fig. 8.10)

takes into account the shrinkage index of ceramics during drying and firing<sup>20</sup>.

Manual fingerprint identification is an analysis process that must take into account as many elements as possible. The microscopic images were taken at the Restoration Laboratory within the National Museum of Bucovina in Suceava<sup>21</sup>.

#### *The conclusions of the dactyloscopic analysis on the artifact*

The anthropomorphic statuette has a somewhat uncertain sexual attribution, due to the position of the legs which is specific to male statuettes, but at the same time presents the swollen abdomen as a possible indicator of early pregnancy. The inventory number from the archeological collection of the Botoșani County Museum is 18668.

The statuette is modeled by hand and we consider that it is somewhat unfinished. It is modeled somewhat carelessly, with anthropomorphic features rather sketched. The hips are oversized and made by pressing the material to the sides. No papillary marks were observed in this area, although we observed the surfaces. The front part has a very shallow pubic triangle, made by unpolished groove (Fig. 9). The dorsal part has oversized buttocks, demarcated by a deep incision. In the knee area the legs are separated, each being individualized. The surfaces have not been sanded as in countless cases of making such objects. It is an artifact left in

<sup>16</sup> Jägerbrand 2007, 21.

<sup>17</sup> Jain – Pankanti 2001, 306.

<sup>18</sup> Jain – Pankanti 2001, 308.

<sup>19</sup> Berry – Stoney 2001, 61.

<sup>20</sup> Králík *et alii* 2002; Králík *et alii* 2008; Králík – Nejman 2007.

<sup>21</sup> On this occasion we express our thanks to colleagues Constantin Aparaschivei and Ionela Melinte from the Restoration Laboratory within the National Museum of Bucovina in Suceava.



Fig. 9. Fotografie macroscopică cu statueta de la Ripiceni-Holm (foto: Sebastian Ciupu, Muzeul Județean Botoșani) / Macroscopic photograph with the statuette from Ripiceni-Holm (photo: Sebastian Ciupu, Botoșani County Museum)

a working phase, after smoothing, being directly burnt. We do not know if the item was burnt intentionally, in the kilns for the manufacture of ceramics, or the firing took place at the same time as the house that was set on fire and thus hardened. The artifact was transported from the archaeological site directly to the ceramic laboratory within the Botoșani County Museum for chemical cleaning. It was introduced into a solution of citric acid, with a concentration of 20% and was monitored

continuously, as there was a risk of damage to the object. After neutralization, a fingerprint was observed on the left knee.

The dimensions of the fingerprint are: length: 31.79 mm, width: 12.62 mm. The fingerprint is two-dimensional. The shape is convex, being determined by the angle of bending of the knee (Fig. 10). The manner of realizing the papillary ridges is of the imprint type. The surface has a large grain, therefore the impressions are not very



Fig. 10. Fotografie color microscopică a ampretei de pe statueta (foto: Ionela Melinte, Muzeul Național al Bucovinei) / Microscopic color photograph of the fingerprint on the statuette (photo: Ionela Melinte, National Museum of Bucovina)

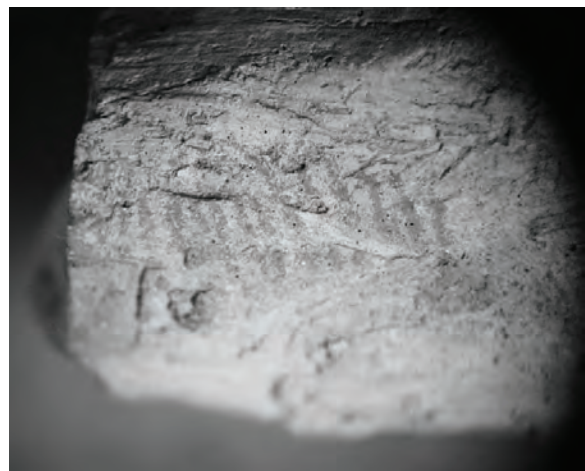


Fig. 11. Fotografie grayscale microscopică a ampretei de pe statueta (foto: Ionela Melinte, Muzeul Național al Bucovinei) / Microscopic grayscale photograph of the fingerprint on the statuette (photo: Ionela Melinte, National Museum of Bucovina)



clear, and the paint is diffused in the structure of the ceramic, resulting in significantly thicker lines than in the case of polished artifacts, which already have closed pores. From the revelation of the papillary ridges, a central imprint is observed, partially preserved (Fig. 10–11). The imprint is perpendicular to the knee of the statuette, with a deviation of about 15 degrees to the right. Being truncated on both sides, the currently visible area, if we join the lines on the curvature specific to the papillary ridges, could be framed in the arch type, the straight pin arch subtype (Fig. 12).

We consider that there is no intentionality in making the imprint; the incomplete impression, as well as its position, leads to this conclusion.



Fig. 12. Liniile amprentei suprapuse peste fotografia microscopică / Fingerprint lines overlaid on microscopic photography

#### *Brief considerations on the analysis of paleodermatoglyphs*

Even if forensics and archeology are separate sciences, they have in common the methodology of searching and discovering material traces, as a result of human activities carried out in the past. Although the digital, palmar or plantar impressions of prehistoric populations have not yet been sufficiently researched and exploited, the data provided by different types of impressions are beginning to be analyzed, researched and used more and more frequently<sup>22</sup>.

Palmprints and fingerprints in general reveal the unique, singular moment in time, when the fingerprint is formed as a result of a direct physical contact with the artifact. Certain physico-chemical conditions have made it possible to transmit these

impressions over the millennia. The number, the location of the fingerprints, the size, the legibility, the elements related to the traceological event, the intentionality, the granulation of the support, all show the activity of a person, exactly during its life, in the same way that skeletons reveal details about the individual's life through pathologies or activities that have determined the changes suffered during life<sup>23</sup>. An archaeological imprint on a single object can reveal four aspects: it provides a sign of an individual's identity; it indicates when the individual was alive; it indicates the geographical area in which the individual lived with the potential for refining to a particular archaeological site or sites; it indicates an activity performed by an individual, respectively: writing a text, sealing an object, having a specific job, etc. As for fingerprints that can be corroborated with other historical sources, they can provide information about the role, rank, occupation, authority of individuals within society, or can provide information about the duration of the individual's activities<sup>24</sup>.

The collection, storage and comparative use of data, preferably from the entire Cucuteni cultural area, could reveal more details about the man behind the artifact. The imprint is a recording transmitted through time, so the proof of the spatial-temporal unity of the body of a certain person, revealing the shape of the fingertips, the dermatoglyphs, the size of the foot, etc. and a certain type of artifact (dye, ceramic, etc.). The spatial location, arrangement, dimensions, legibility, combination and overlap of papillary traces on artifacts provide an opportunity to reveal concrete aspects of the human being and his behavior in the past<sup>25</sup>.

By collecting as much data as possible, ideally, a series of objects could be related to a certain creator/artist/craftsman. The importance of studying such artifacts through statistical analysis of fingerprints also lies in the fact that in this way the movements of families, communities, tribes and populations could be detected and tracked, provided that there is sufficient and conclusive material<sup>26</sup>. The number of fingerprints on a vessel does not provide the exact number of people. The physical and chemical processes that take place after deposition can affect a whole series of fingerprints.

There is no certainty that all the fingerprints on an artifact belong to a single individual. A single individual can have a single left femur, while a large

<sup>22</sup> Moran 2007, 18.

<sup>23</sup> Králík – Nejman 2007, 11.

<sup>24</sup> Moran 2015, 10.

<sup>25</sup> Králík *et alii* 2008, 4–5.

<sup>26</sup> Åström 2007, 2.

number of fingerprints can be produced using a single region of the papillary ridges. Artifacts are often incomplete and there is a risk to evaluate two unrelated fragments of the same vessel as two separate artifacts, but the fingerprints actually belong to a single individual<sup>27</sup>.

The limits of the analysis of prehistoric fingerprints are primarily related to the medium of transmission, the manner of preservation and collection. After repeated analyzes and anthropological measurements, it was found that in a single individual, the width of the papillary ridges varies on the inside of one hand, the differences being quite small, up to 0.5 mm wide. The ridges of the palms tend to be noticeably thicker than those on the fingertips. Of the ridges on the fingertips, the thickest ridges were observed on the thumb, and the thinnest on the ring finger. In general, the right hand has rougher ridges than the left hand<sup>28</sup>. An index of 0.05 mm width was estimated for the contraction of ceramic vessels under the action of fire<sup>29</sup>.

Assigning age is an even more difficult issue. Children's fingerprints on prehistoric artifacts open the discussion on the manufacture and ownership of artifacts. Except for intersex and interpopulation differences in size and shape, the natural constitution of the body differs greatly between children and adults. The comparison between the corresponding body imprints allows the establishment of a correlation scale between size and age, thus attributing an artifact to the appropriate age category, in terms of "children" and "adult individuals". In the case of attempts to accurately assign an impression to a certain age category, things become more complicated. Many key aspects need to be considered, such as the anthropological development of the adult, which varies between populations, the biological growth rate, the nutritional and social factors, that all influence the rhythms of body development. Approaching the situation from the point of view of prehistoric populations, these issues cannot be clarified without a reference sample containing data on the chronological age of people. In the case of a single cultural sequence, as a single chronologically and spatially limited culture is analyzed, this sample may be omitted, but it is necessary when comparing neighboring or chronologically different cultures<sup>30</sup>.

The present case studies demonstrate the applicability of the forensic methodology of

investigation in the field of research of archaeological artifacts, and at the same time offer the possibility of obtaining results validated by scientific methods. The prehistoric items that present a human papillary imprint are very little known among the discoveries made in the settlements and necropolises attributed to the Neolithic and Eneolithic on the Romanian territory. We must emphasize, once again, not only the rarity of the artifacts with paleoderamatoglyphs preserved in the area of Cucuteni culture, but also the shortage of dactyloscopic analyzes performed on prehistoric archaeological cultures so far.

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