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CRIMINAL EVIDENCE THROUGH DNA FINGERPRINTING AND ITS IMPACT ON THE RIGHT TO PRIVACY

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ABSTRACT

DNA fingerprinting has become one of the most significant pieces of evidence in criminal law today, prompting many countries to adopt it as a solution to various criminal cases. However, the rigid application of this technology may lead to significant difficulties, particularly concerning protecting individuals from potential violations of their right to privacy. Consequently, criminal legislation has worked to establish a set of guarantees that can effectively safeguard the right to privacy, as exemplified by the Algerian legislature.

KEYWORDS

DNA Fingerprinting, Guarantees, Right to Privacy

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Introduction.

Technological advancements have influenced various aspects of life, extending even to the negative side, where criminals have exploited all available advanced means to satisfy their perverse desires by violating the law and erasing traces of their criminal acts. In contrast, scientific progress has also extended to the field of law to confront these challenges with appropriate measures in line with their severity. As a result, reliance on advanced scientific evidence has emerged as a response to the evolving methods of crime and the increasing prevalence of daily criminal activity.

Among the most significant modern tools in the field of criminal evidence is DNA fingerprinting, owing to the prominent and effective role this technique plays, particularly in establishing a link between the crime and its perpetrator.

However, owing to the excessive use of this technique by some countries without considering human rights and individual privacy, the issue of evidence through modern forensic tools, in general, and DNA fingerprinting in particular, raises numerous challenges concerning human rights and freedoms, especially the right to privacy, which is considered one of the most important.

Scholars have not reached a comprehensive and universally accepted definition of the right to privacy, as this seems difficult owing to the broad scope of private life and the diversity of its elements. This has led to differing opinions regarding the establishment of a legal definition that encompasses it. Moreover, the concept of individual privacy varies from one society to another and from one time period to another. In fact, individual privacy differs from one person to another within the same society, depending on the surrounding circumstances.[1] However, it has been agreed that protecting individuals' privacy is one of the most crucial issues in human rights.

[1] Francisco Ramírez Peinado, *"Les fichiers d'empreintes génétiques : les systèmes français et espagnol à l'égard de la Convention européenne des Droits de l'Homme," La Revue des droits de l'homme* [Online], no. 6 (2014), published online on December 2, 2014, accessed May 9, 2017, http://revdh.revues.org/965, DOI: 10.4000/revdh.965, p. 4.

In light of the benefits provided by DNA fingerprinting in criminal investigations and in identifying perpetrators of crimes, many countries have sought to adopt this technique in a manner that ensures a balance between the necessity of suppressing and combating crime on the one hand and the need to protect individuals from state abuses on the other hand. The interest of maintaining public order should not take precedence over individual freedoms in an absolute manner, nor should liberties be granted in a way that harms others or disrupts public order.

On the basis of the above, the central issue of this study is as follows:

To what extent are the guarantees established by comparative legislation effective in protecting the right to privacy from violations in the context of DNA fingerprinting?

To answer this question, it is necessary to define the concept of DNA fingerprinting (Chapter One) and then explore the key guarantees established to protect the right to privacy from violations that may arise from this procedure by examining some comparative legislation alongside Algerian legislation (Chapter Two).

Chapter One

Concept of DNA Fingerprinting

Humanity's scientific and technological advancements since the beginning of the 21st century have led to the development of a modern means of proof with conclusive and precise results: DNA fingerprinting. This is considered a biological form of evidence in the field of forensic science and one of its most important modern tools. Accordingly, we will examine the concept of DNA fingerprinting (Section One) and its applications in comparative legislation (Section Two).

Section One

Concept of DNA Fingerprinting

DNA analysis, commonly known as DNA fingerprinting, is one of the most important scientific techniques in many criminal cases. The definitions of this term have varied owing to its recent emergence, as DNA fingerprinting was not known in the past. It was only introduced with precision in 1984 when the British geneticist Alec Jeffreys from the University of Leicester astonished the world by discovering specific gene patterns that allow us to understand who we are based on our genetic traits or fingerprints.[1]

Among the most important definitions of DNA fingerprinting are "genetic evidence", which refers to the detailed hereditary markers that indicate the identity of an individual, and it is an almost infallible method for confirming biological parentage and verifying identity. "[2]

It has also been defined as "The genetic structure obtained through the analysis of one or more genetic markers in the DNA."

From these definitions, we can conclude that "DNA fingerprinting" refers to establishing an individual's identity on the basis of a sample of their DNA (deoxyribonucleic acid), which they inherit from both their father and mother. Each person carries 46 chromosomes in their genetic cells—23 chromosomes inherited from their father via the sperm cell and 23 from their mother via the egg cell. Each of these chromosomes, which contain genetic material, consists of a pair of genes inherited from the father and the mother. As a result, the individual possesses a unique combination of chromosomes that does not entirely match the father's or the mother's chromosomes but is a mixture of both.[3]

DNA fingerprinting has played an important role in many fields, particularly in our area of study, forensic science. Its use has enabled the discovery of thousands of crimes previously classified as unsolved. DNA fingerprinting has exonerated hundreds of individuals in cases of murder and rape while also convicting others.

Moreover, DNA fingerprinting serves as the basis for accurate resolution of crimes such as theft, murder, and rape. It allows for the use of any trace left by the criminal at the crime scene (such as skin cells, flesh, blood, hair, saliva, or semen) from which DNA can be extracted, even if a significant amount of time has passed. Additionally, it helps save time and money for the parties involved, as it is a procedure characterised by speed and precision in evidence gathering.[4]

[1] Hosni Mahmoud Abdel-Daim, *DNA Fingerprinting and Its Admissibility in Evidence* (Alexandria, Egypt: Dar Al-Fikr Al-Jami'i, 2009), 10.
[2] Mohamed El-Madani Boussaq, *The Position of Sharia and Positive Laws Regarding the Use of DNA Fingerprinting* (Riyadh: Arab Security Sciences University, 2008)
[3] Toufik Soultani, *The Admissibility of DNA Fingerprinting in Evidence* (Master's thesis, University of Batna, 2011), 14.
[4] Marie Angèle Grimaud, *La preuve par identification génétique en droit canadien* (Thèse de doctorat, Université de Montréal, Canada, 1999), 61.

DNA fingerprinting has revolutionised forensic medicine and criminal sciences due to the accuracy of its results, granting it distinctive advantages over other types of scientific evidence. Among these key characteristics are as follows:

- The uniqueness of DNA fingerprints among individuals: No person on Earth shares the same DNA fingerprint, except for identical twins. Every individual, in addition to these twins, possesses unique inherited characteristics. Each nucleus within the human body's cells contains chromosomes, which are thin strands twisted around each other, storing all the genetic information about the individual, referred to as DNA.[1]
- The DNA fingerprint is characterised by the diversity and variety of its sources (blood, saliva, semen, tissue, bone, skin, hair). Scientific research has proven the possibility of extracting DNA from human bones up to 300 years of age and identifying the true identities of their original owners.[2]

Section Two

Applications of DNA Fingerprinting in Compared Legislations

When DNA fingerprinting was first discovered, it was initially met with scepticism and rejection by judges, legal professionals, and society. After its first use in 1985 in the United Kingdom to determine paternity at the request of the immigration office to resolve a dispute, the discovery was met with resistance and doubt in America and Europe. People rejected the results of DNA fingerprinting, and the pioneers of this discovery had to be patient and offer various facilitations, such as establishing private companies for DNA fingerprinting, bringing in international experts to conduct analyses, defending it in court, and explaining the technique to judges. Additionally, some companies in the United States began offering national services by categorising criminals' DNA fingerprints and storing them in a database.[3]

This led to increased public awareness of the reality of DNA fingerprinting. Western countries quickly recognised this significant discovery and began incorporating it into their civil and criminal courts. For example, American courts first used DNA fingerprinting as evidence in 1988. In January 1989, the Central Intelligence Agency (CIA) began conducting careful studies on this technology in its laboratories to evaluate the acceptance of DNA fingerprinting test results. Shortly thereafter, it was used in more than one hundred cases in the United States.[4]

Owing to its distinctive features, DNA fingerprinting has proven its effectiveness in forensic medicine and criminal law. As a result, legal systems have allowed its use in proving crimes and exonerating the wrongly accused. Most global legislations have hastened to accept DNA fingerprinting and have established rules to regulate its use. Among these legislations are the following:[5]

In French Law:

The case of the English girl Caroline Deschenon, who was murdered after being raped in the city of Bénin-Fougeres in France on July 18, 1996, served as the primary catalyst for the establishment of France's National Automated DNA Database. Most legal scholars criticised the investigative judge's approach in this case, particularly the DNA testing conducted on all adults in the city, as such a procedure conflicted with the right to privacy and the individual's right to physical integrity.[6]

The database was established under Law No. 98--468, dated June 17, 1998, which concerns the prevention and repression of sexual crimes. Its functions were defined under Decree No. 2000--413, dated May 18, 2000.

This law added Articles 706--47 to 706--54 to the Code of Criminal Procedure, with Article 706--54 stipulating the establishment of a national register aimed at collecting the DNA fingerprints of individuals convicted of crimes listed in Article 706--47, including premeditated murder, murder of a minor, rape, torture, or barbaric acts. The purpose of this registry was to facilitate the identification of sexual crime perpetrators

[1] Inas Hashem Rashed, "DNA Fingerprinting Analysis and Its Legal Admissibility in Legal Evidence Issues: A Comparative Study," *Al-Risala for Law Journal*, 4th year, no. 2 (2011): 218, Faculty of Law, University of Karbala, Iraq.
[2] Mohamed Ahmed Ghanem, *Legal and Sharia Aspects of Criminal Evidence through DNA Fingerprinting* (Alexandria, Egypt: Dar Al-Jama'a Al-Jadida, 2008), 62.
[3] Saad El-Din Mas'ad Helali, "DNA Fingerprinting and Its Areas of Application," paper presented at the 16th Conference of the Islamic World League, Mecca, November 10, 2002, 6.
[4] Saad El-Din Mas'ad Helali, *DNA Fingerprinting and Its Legal Relationships* (Cairo: Wahba Library, 2011), 3.
[5] Jamil Abdul-Baqi Al-Saghir, *Criminal Evidence and Modern Technology* (Cairo: Dar Al-Nahda Al-Arabiya, 2002), 82 and following pages.
[6] Fouad Bousbaa, *DNA Fingerprinting and Its Legitimacy in Denying and Proving Lineage* (Master's thesis, Faculty of Law and Political Science, University of Constantine, 2011), 49.

and to track them. This registry is placed under the supervision of a judge. Since then, these provisions have been incorporated into the Code of Criminal Procedure and amended several times.

The legislature responded to criticisms raised regarding the law's content, particularly its limitation to the DNA fingerprints of individuals convicted of the crimes mentioned above. Therefore, on November 15, 2001, the legislature issued the "Daily Security Law," which expanded the scope of the registry by adding Article 706--55 to the Code of Criminal Procedure. This amendment broadened the range of crimes covered, including theft and terrorism.[1]

United States of America:

DNA testing was first used in the U.S. in 1986 in a case heard by a court in Pennsylvania. Since then, the use of this technology has rapidly expanded.

In 1994, a law was enacted regarding identity determination through DNA fingerprinting. This law provided funding to local authorities to support the implementation and improvement of DNA testing in laboratories.

By 1998, the Federal Bureau of Investigation (FBI) established another system for DNA fingerprinting records called the "NDIS" (National DNA Index System). This system contains DNA profiles submitted by contributing states and allows these states to exchange information, compare, and coordinate investigations.[2]

Algerian Legislation:

Like other developed countries, Algerian legislatures hastened to regulate the use of DNA fingerprinting. Through the issuance of Law No. 16-03,[3] the legislature outlined the conditions and procedures for using this technique in evidence collection at various stages of biological sample collection by authorised personnel, ensuring the protection of the freedoms and dignity of individuals subjected to genetic analysis and their personal lives. This is managed by a central DNA fingerprinting service, overseen by a judge and supported by a technical cell responsible for forming, managing, and maintaining the national DNA database obtained from biological sample analyses.

By enacting this law, the legislature has taken significant steps toward activating an important modern method of evidence. This method has been adopted by many countries worldwide and used as evidence in various cases, particularly in identifying criminals on the one hand and verifying biological parentage and proving lineage on the other hand. This is because the results of genetic expertise are almost conclusive in evidence, and the judge's confidence in them is unwavering, allowing judgments to be issued with complete trust and assurance.

Chapter Two

Legal Protection of the Right to Privacy from Violations Resulting from DNA Fingerprinting

The issue of protecting the right to privacy from violations that may arise through DNA fingerprinting has gained significant attention internationally. Most international agreements and charters have explicitly prohibited the infringement of this privacy, alongside national legislation, such as the Algerian legislature, in Article 03 of Law No. 16--03, which concerns the use of DNA fingerprinting in judicial procedures and the identification of individuals.[4]

Therefore, many legislators have worked to surround DNA fingerprinting with a set of guarantees, and respecting these guarantees reduces the excessive use of this procedure. It depends on fulfilling a specific set of conditions (Section One). Additionally, criminal protection has been established for the right to privacy in the event of any violation occurring within the context of genetic engineering (Section Two).

[1] Elsa Supiot, *Le procès pénal à l'épreuve de la génétique : Rapport scientifique d'une recherche collective réalisée entre mai 2015 et mai 2017 avec le soutien de la Mission de Recherche Droit et Justice (Convention n°215.05.26.28)* (Institut des sciences juridiques et philosophiques de la Sorbonne, June 2017), 5-11.

[2] Fawaz Saleh, "The Role of DNA Fingerprints in Criminal Cases," *Damascus University Journal of Economic and Legal Sciences*, vol. 23, no. 1 (2007): 304-305.

[3] *Law No. 16-03*, dated June 19, 2016, concerning using DNA fingerprinting in judicial procedures and identifying individuals, *Official Gazette*, no. 37, June 28, 2016.

[4] *See Article 03 of Law No. 16-03*, dated June 19, 2016, concerning using DNA fingerprinting in judicial procedures and identifying individuals, *Official Gazette*, no. 37, issued on June 28, 2016.

Section One

Legal controls for DNA fingerprinting

The unique nature of DNA fingerprinting, particularly in terms of its impact on individual rights—especially the right to privacy—requires clear and effective efforts from states to regulate the legal controls concerning the institutions responsible for conducting such tests and the procedures involved.

With respect to the institutions responsible for performing DNA fingerprinting, which guarantees the right to privacy, numerous international agreements have addressed the protection of human rights through various applications of DNA fingerprinting. One of the most prominent of these is the "Universal Declaration on the Human Genome and Human Rights", which was adopted by the UNESCO Conference in 1997 and endorsed by the UN General Assembly in 1998. This declaration emphasised the need to respect each individual's uniqueness and affirmed the state's responsibility to provide legal guarantees that would protect individual rights. This includes exercising oversight over the work of institutions engaged in genetic testing.[1]

At the level of national legislation, the United States is at the forefront of countries that have established such institutions and organised their legal operations.[2] Perhaps the most significant development in this area was the issuance of the 1994 DNA Identification Act, which required institutions and laboratories to adhere to a set of rules, particularly regarding protecting personal information, under the threat of criminal prosecution for noncompliance.[3]

As for French legislation, it has also made efforts to establish legal controls governing and regulating the work of institutions responsible for genetic testing. This is evident from Decree No. 97-109, dated February 6, 1997, concerning the conditions for licensing qualified individuals to carry out identity determination through DNA fingerprinting, whether in judicial or nonjudicial contexts. This decree established a specialised committee to approve the appointment of qualified persons to perform DNA fingerprinting, chaired by a judge. The committee is tasked with providing opinions on the reliability of genetic testing procedures.[4]

The situation is not much different from that of other developed countries such as Japan, England, and Spain, which have established health institutions for genetic testing, all of which are subject to state supervision.[5]

The Algerian legislature followed the example of developed countries in establishing a DNA fingerprinting database. It stipulated the necessity of creating a Central DNA Fingerprinting Service responsible for storing and preserving genetic information through the enactment of Law Nos. 16--03, specifically in Chapter Three under the title Central DNA Fingerprinting Service. This is reflected in Article 09, which states, "A Central DNA Fingerprinting Service shall be established within the Ministry of Justice, managed by a judge assisted by a technical team."

Regarding the conditions related to the procedure, for the genetic analysis to be legally conducted, the intrusion on the right to privacy must be proportional to investigating the crime.

In this context, the Council of Europe issued Recommendation Nos. 1--92, which includes a set of principles aimed at ensuring the protection of individual rights and freedoms. Among the most important of these principles are as follows:

- The refusal to use DNA fingerprinting procedures except for criminal investigation purposes.
- The necessity of obtaining permission from the competent authority.
- DNA fingerprinting may be conducted only for crimes explicitly defined by law and classified as serious offences.[6]

Additionally, the French legislature has surrounded the DNA fingerprinting procedure with several judicial guarantees and a well-organised framework to achieve a balance between the legitimate goal of combating crime on the one hand and the protection of individuals' fundamental rights on the other hand.[7]

[1] Nour El-Houda Zaghbib, *Genetic Engineering and the Criminal Protection of the Human Genome* (Master's thesis, Specialisation in Criminal Law and Criminal Sciences, Faculty of Law, Mentouri University of Constantine, 2009), 34-37.
[2] Ammar Turki Atiyah, "DNA Fingerprinting and Its Impact on Criminal Evidence," published article, accessed April 1, 2018, http://www.jcolaw.uobaghdad.edu.iq/uploads/N-2007-2/amar%20trky.pdf, 248.
[3] Elsa Supiot, *Le procès pénal à l'épreuve de la génétique*, op. cit., 233.
[4] Francisco Ramírez Peinado, "Les fichiers d'empreintes génétiques : les systèmes français et espagnol à l'égard de la Convention européenne des Droits de l'Homme," *La Revue des droits de l'homme* [Online], no. 6 (2014), p. 16.
[5] Ammar Turki Atiyah, *op. cit.*, 24.
[6] Nour El-Houda Zaghbib, *op. cit.*, 164.
[7] Francisco Ramírez Peinado, *op. cit.*, 21.

For the Algerian legislature, after the general rules governing evidence of the admissibility of the use of scientific methods in evidentiary matters were stipulated, it was necessary to impose several restrictions to ensure that the DNA test was conducted with high accuracy, thus ensuring that individuals' rights, especially the right to privacy, were not violated.

Among these restrictions, the law limits individuals subject to DNA fingerprinting tests. Referring to Article 5 of Law No. 16--03, the legislature explicitly specifies the individuals from whom DNA samples can be taken.[1] The same article also clearly defines, in explicit terms, the crimes that may be proven via DNA fingerprinting technology. These crimes are classified under the law as felonies and misdemeanours, and they include the following:

- Crimes or misdemeanours against state security.
- Crimes or misdemeanors against individuals or public morals.
- Crimes or misdemeanors against property or public order.
- Crimes are stipulated under the Anti-Drug Law or the Anti-Money Laundering and Terrorist Financing Law.

Any other felony or misdemeanour deemed necessary by the competent judicial authority.

In general, most legal systems have made the severity of the crime a prerequisite for using DNA fingerprinting in criminal evidence, as seen in the French Criminal Procedure Law and English Law. Both laws stipulate that the crime in question must be punishable by a sentence of at least five years for DNA fingerprinting to be used as evidence. Therefore, judicial authorities are not permitted to use DNA fingerprinting in cases involving minor offences.[2]

Section Two

Sanctions for Violating the Right to Privacy in the Context of DNA Fingerprinting

Genetic information related to an individual is highly sensitive when it is disclosed or used for nonmedical, nonscientific, or nonjudicial purposes. It often pertains to private aspects of an individual's life. Since revealing such information is unnecessary for judicial investigations, scientific research, or medical purposes, it is considered unlawful. In many cases, this involves personal life matters; therefore, numerous legal systems have criminalised such actions to emphasise the utmost importance of protecting private life against such unlawful conduct.

Among these legislations, we find French law, which has adopted various forms of such offenses, included in Section Six of the French Penal Code under the title:

"Des atteintes à la personne résultant de l'examen de ses caractéristiques génétiques ou de l'identification par ses empreintes"

("Offenses against the person resulting from the examination of their genetic characteristics or identification through their fingerprints").[3]

One of the crimes addressed is the study of an individual's genetic traits, an act defined and penalised under Article 226--25 of the French Penal Code.[4] This study can be used to determine an individual's predisposition to certain diseases, thus revealing personal health information. In this context, when the French legislature prohibits such studies without the explicit consent of the individual involved, the intention is to deter others from obtaining information about a person's current or future health status. This ensures that French law defends the confidentiality of one of the key elements of an individual's privacy, specifically regarding their health.[5]

To prevent the identification of an individual through genetic fingerprinting outside the legally established frameworks, the French legislature explicitly provided in Articles 226--28, Paragraph 1 of the French Penal Code, a penalty for violating this safeguard. Therefore, any attempt to identify an individual for nonmedical or nonscientific purposes or outside judicial procedures is subject to deterrent measures, as such practices may violate rights closely tied to an individual's personality. In this way, the French legislature

[1] *See Article 05 of Law No. 16-03*, *op. Cit.*
[2] Ammar Turki Atiyah, *op. cit.*, 229.
[3] Nour El-Houda Zaghbib, *op. cit.*, 90.
[4] *Article 226-25* du **Code pénal français** dispose : « Le fait de procéder à l'examen des caractéristiques génétiques d'une personne à des fins autres que médicales ou de recherche scientifique, ou à des fins médicales ou de recherche scientifique, sans avoir recueilli préalablement son consentement dans les conditions prévues par l'article 16-10 du code civil, est puni d'un a d'emprisonnement et de 15 000 euros d'amende. »
[5] Abdelaziz Nouiri, *Criminal Protection of the Right to Privacy* (PhD dissertation, Faculty of Law and Political Science, University of Batna, 2011), 196.

ensures privacy protection, especially concerning health or family matters, by stipulating that these practices must be conducted carefully by healthcare professionals alone and solely for the benefit of the individual involved.[1]

In addition, we find the misdemeanour of disclosing information related to the identification of another person through DNA fingerprinting, as stipulated in Articles 226--28, Paragraph 2 of the French Penal Code. This provision punishes the act of revealing information related to the identification of another person through genetic fingerprinting with imprisonment and a fine. This criminalisation places significant emphasis on protecting private life, highlighting the importance of safeguarding personal information from unauthorised disclosure.[2]

Similarly, the Algerian legislature has not overlooked the need to impose penalties for using DNA samples for purposes other than those specified in Laws 16--03. The law classifies this offense as a misdemeanour according to Article 17 of the same law. The penalty for this offense includes imprisonment for a period ranging from one year to three years, along with a fine ranging from 100,000 DZD to 300,000 DZD.

Additionally, as stipulated in Article 18 of the aforementioned law, disclosing data recorded in the National DNA Database is a crime. This offense is punishable by imprisonment for a period of six months to three years and a fine of 100,000 DZD to 300,000 DZD.

Conclusions

In conclusion, this study highlights that one of the most important principles and controls that must be considered when conducting DNA fingerprinting analysis on individuals is respecting their right to the sanctity of their private life and protection from any intrusion that might harm it. However, this right is not absolute, as it is not permissible, nor should it ever be acceptable to prioritise private interests over public interests. While the general rule dictates that individuals' privacy and personal lives should remain inviolable, an exception exists wherein the right to privacy may be infringed upon to uncover the truth, collect evidence, and investigate crimes to protect the public interest. This infringement must, however, be within specific and justified limits.

Comparative legislation has worked to establish this, such as requiring permission from competent authorities when conducting such analyses. Furthermore, any information sought through these procedures must be confined to the intended purpose, and the analysis should be conducted to ensure that no harm is inflicted upon the individual being analysed.

In addition to the Algerian legislature, who has also ensured, both in the Constitution and in Law No. 16--03, the necessity of respecting these rights during the various stages of biological sample collection, the legislature has also defined the authorities responsible for taking these samples, the individuals subject to these analyses, and criminalised several actions that may lead to violations of an individual's right to privacy.

However, despite these efforts, the issue of protecting the right to privacy from potential violations resulting from DNA fingerprinting remains a subject of intense debate and discussion owing to its sensitivity and the differing perspectives on it.

Therefore, there is a need to unify the efforts of all parties in the international community to establish more guarantees and work towards achieving a proper balance between individual interests and societal interests. This should be done by aligning with constitutional rights and other rights, including those related to privacy and data protection, but without imposing unnecessary restrictions.

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[1] Abdelaziz Nouiri, *op. cit.*, 198.
[2] Nour El-Houda Zaghbib, *op. cit.*, 106.

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