

MORPHOLOGICAL DIVERSITY OF ANCIENT MINARETS ARCHITECTURE IN THE ZIBAN REGION (ALGERIA): THE QUESTION OF FORM, STYLE AND CHARACTER (1)

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1. This paper is fully based on a dissertation in progress.

INTRODUCTION

In the process of perception, all architectural objects are bearers of meaning even if those who create them do not intend to send a message or an idea. This process differs from one to another depending on the observer's belonging, thought and imagination. In this context, vertical buildings and monuments play an important role in the perception of space and the universe; they have been used in different cultures and civilisations throughout human history, especially in spiritual and religious terms (Alihodzic and Zupančič, 2018). Islamic civilisation is no exception; certain elements have been used in Muslim religious architecture with various morphological appearances to establish a vertical relationship with God. The minaret is one of these elements. Given its significance and function, it is the most important component of the mosque's architecture. It is a tower from which a *muezzin* or a *crier* calls the believers to pray five times a day. The minaret is considered as one of the unique features of the mosque by the embodiment of the mosque itself (Gottheil, 1910). In general, a minaret consists of four main parts (segments), which are successively from bottom to top: a basement, a shaft/tower (the main part of minaret's body), a gallery-balcony (the platform from which the *muezzin* calls out the *adhan*) and the top/lantern (the upper part of the minaret's body). Using these basic components, the Muslim master builders have combined and composed with them in a sophisticated manner to generate a wide morphological diversity of minarets.

In southern Algeria, minarets symbolise and distinguish local Muslim communities by their morphology in human settlements. They are the most emblematic element of the Ksour (Ksar, singular) and are the central landmarks of their respective urban landscapes. The region of the Ziban (Zab, singular) illustrates this observation and provides an interesting field of research for the scientific knowledge of these minarets. The latter have sometimes been mentioned in several studies but have not been the subject

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of an exhaustive analysis so far. These considerations raise the following questions: What are the morphological attributes of the ancient minarets in the Ziban region? Do they have their own local specificities? Can it be said that the minarets of the Ziban region have their own style, which is continuous throughout its history, or does each period represent stylistic variations? What factors have influenced their morphology?

The present research focuses on the morphological characterisation of minarets in the Ziban region. It is particularly interesting to understand the origin of the morphological diversity observed in the design of the minarets shafts in the Ziban region. The aim is to shed light on the possible reasons that led to the formal diversity of the Ziban minarets in a relatively limited geographical area. In addition, the paper seeks to explore the significant morphological attributes and stylistic contributions of these minarets and to gather information on their morphological diversity through inventories, architectural surveys, visual and formal analyses.

PRESENTATION OF THE STUDY AREA: THE ZIBAN REGION

The Ziban region corresponds administratively to the Wilaya (province) of Biskra in the south-east of Algeria. It is a key link between the north, the south and the west. Thanks to its geographical location, this region was the horizon of many significant civilisations and cultures: the antique periods, the Arab-Islamic period (7th and 14th centuries), the Ottoman period (1541-1844) and finally the French colonisation period (1844-1962). These periods revealed a variety of urban and architectural styles corresponding to the different cultures that developed on its territory. The Ziban region is divided into four distinct zones named according to their geographical location: the northern Zab (*Dahraoui*), the southern Zab (*Guebli*) and the eastern Zab (*Chergui*) (Cataldo, 1954). Biskra is considered the independent central Zab (Largeau, 1881). Each Zab consists of several sub-regions, including human settlements in the form of Ksour, organised around a Muslim religious institution (mosque or *zaouia*) (**Figure 1**).

DATA COLLECTION AND METHODS

The research was divided into two main stages, namely data collection and analysis. The first stage of the investigation aimed to compile a documentary background on the architecture of minarets in general, and that of the Ziban in particular. To this end, books, articles and historical, old travel accounts, were used. In addition, fieldwork was carried out, including architectural surveys of the ancient minarets in the Ziban region. However, in the case of demolition/reconstruction or partial transformation of the minaret, the graphic restitution of the latter was carried out based on the iconographic documents available. Indeed, during the French colonial period, several mosques with their minarets were the subject of a number of sketches and photographs taken by Auguste Maure and other artists. The data collection also included interviews giving voice to the memory and testimony of the elderly to fill the documentary gaps concerning the dating of the minarets. The second stage of the investigation focused on morphological analysis. On the basis of a comparison of drawings and old photographs of the different minarets, the formal and stylistic attributes of the shafts were highlighted. As for the constitution of the study corpus, it was made on the basis of minarets chosen according to the chronological

mosque. The minaret, as an underlying part of the layout of the mosque, is the development of later Islamic styles from the Mamluk, Timurid, Ottoman, Safawid and Moghal periods (Doğan, 1974) (Figure 2) The presence of minarets at each corner is a feature of mosques in Egypt, Iran, India and particularly in Turkey, unlike in the Islamic West (Maghreb and Iberian Peninsula), where there is only one minaret (Benyoucef, 2005).

Nowadays, minarets appear in a wide variety of designs, forms and heights. This obvious architectural diversity comes from the combination of a limited number of elements which are: the basement, the shaft (tower), the gallery (balcony) and the top (lantern). Inside the minaret tower, a staircase turns upwards providing structural support to the whole structure. At first sight, the architectural variations concern the shape, size and, of course, the decoration of the four cross-sections (segments) of the minaret. However, it is believed that the way in which the tower has been structured, in particular the presence or absence of the various segments, their highlighting or their removal have largely contributed to shaping the final appearance of the minaret. Indeed, one of the segments may be missing, it may also be merged with the preceding/next part, or on the contrary, it may be duplicated and highlighted. In all these cases, it is the whole form of the minaret which will be transformed. In the same way, the plan's configuration has influenced the shape of the tower. Considering that square, rectangular, octagonal and circular planes have been used, the minarets take on different shapes, ranging from the tall, pencil-slim towers of Ottoman mosques to the multi-storeyed towers of Egypt and the square shafts of the Islamic West mosques (Bloom, 2002). Some types of minarets, especially multi-storey minarets, may vary their geometric shape from one storey to another. For example, a typical three-storey minaret, such as those built in Cairo during the Mamluk period, has a square shaft in the lower part, octagonal in the middle and cylindrical at the top. The height and

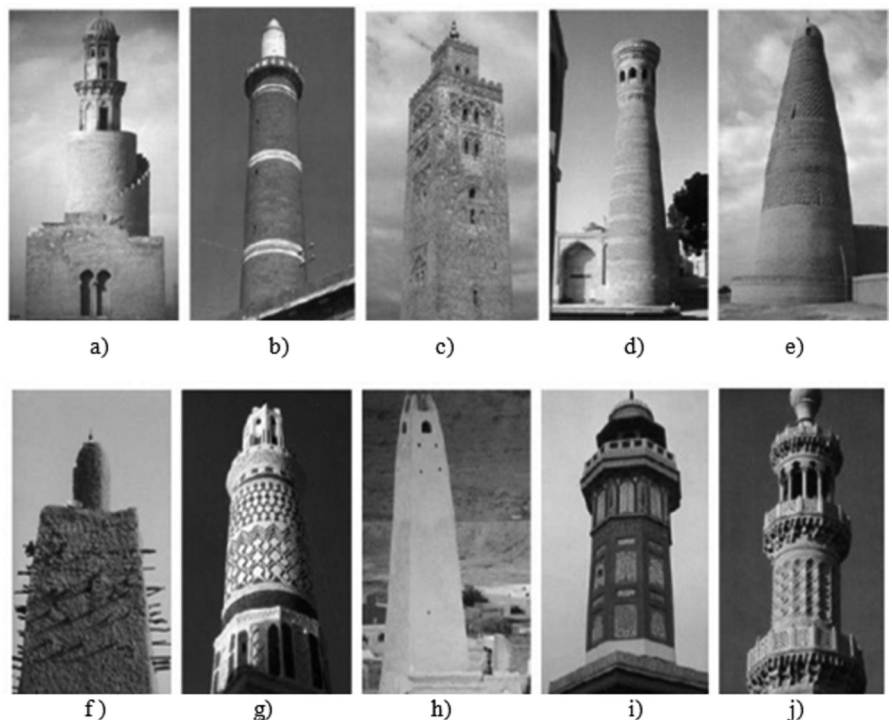


Figure 2. Different minarets of different cultures (Doğangün et al., 2006).

a) Cairo, Ahmad Ibn Tulun mosque (Tulunid period, 876-9); b) Diyarbakir, Turkey, Ayni mosque (Ottoman period); c) Marrakech, Morocco, Kutubiyya mosque (Almohad period, 12th century); d) Bukhara, Uzbekistan, Kalyan mosque (1514); e) Turfan, Xinjiang Province, West China, Amin mosque, (1778); f) Tomboukte, Mali, Djinguere Ber mosque (Songhay period, 14th century); g) San'a Yemen, Al-Bakiriyya mosque (Ottoman Period, 1598); h) Beni-Isguen, Algeria, mosque of the Saharawi village of M'zab; i) Lahore, Pakistan, Wazir Khan mosque (Mughal period, 1634); j) Cairo, Amir Qurqumas mosque (end of the Mamluk period, 1506).

number of stories of the tower also influences the visual attributes of the minaret.

In Morocco, Algeria and Tunisia (small Maghreb), the minarets are square, reminiscent of the Syrian-Umayyad minarets. Indeed, the majority of architectural historians have argued that the Maghreb square minaret such as those found in Syria, North Africa and Spain, originate from church towers (Bloom, 2002). Moreover, considering the minaret of the Great Kairouan mosque (8th century) is the oldest square minaret in the Maghreb; researchers have suggested that the minaret inspired the local builders. In each region, they followed this basic model and reinterpreted it in their own architectural traditions (Bloom, 2002). The minaret of the Great Kairouan mosque is erected on a massive square plan, but its structure is in fact made up of three superimposed square towers of decreasing widths. The total height of the minaret is about 32 m (Figure 3). According to Golvin's (1974) detailed description, the first tower, 18.90 m high and 10.70 m wide, tapers upwards with a difference of about 50 cm. The second tower, 5 m high and 7.65 m wide, has three flat-bottomed arched niches on each of its four facades. The third tower, probably redesigned during the Hafsids period (1228-1574), is a 5.45 m high lantern with a ribbed cupola overhanging it. The minaret is decorated with rounded merlons, which visually increase its height. This motif has been used since Antiquity in Ifriqiya. The pyramidal distribution of the Kairouan mosque minaret demonstrates its affiliation to the ancient lighthouses that dotted the Ifriqiyian coasts. Its interior structure is characterized by a staircase, covered with creeping cradles, which revolves around a central stack of square shape of 1.92 m (Saadaoui, 2011). According to Benyoucef (2005), this minaret served as a prototype for the Islamic West mosques. Its attractive morphological composition is considered as an extraordinary achievement of Islamic architecture, which explains why it was accepted, disseminated and developed in different countries. This prototype remained more or less stable until the arrival of the Ottomans in the Maghreb (16th century), who introduced new forms and styles of minarets.

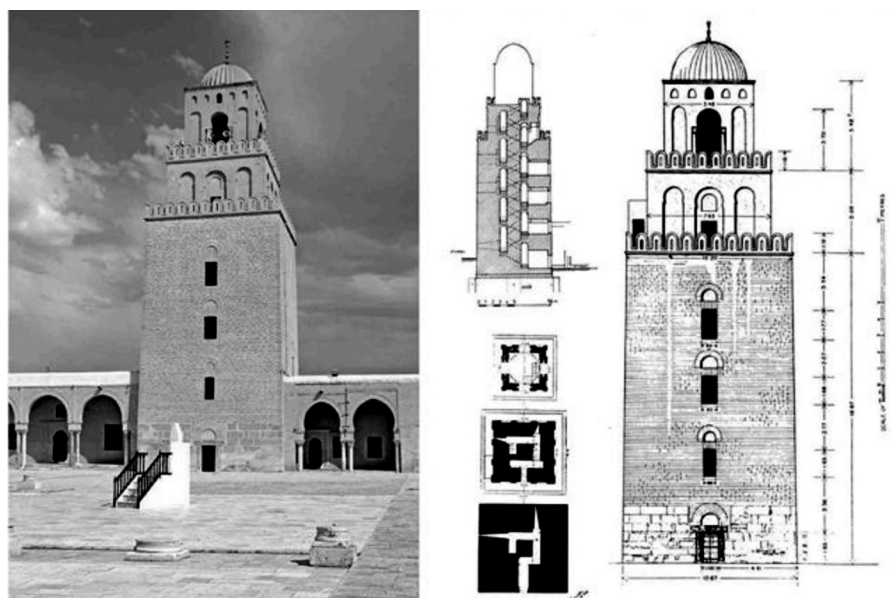


Figure 3. View, elevation, plans and section of the minaret of the Kairouan Mosque (Longo, 2016).

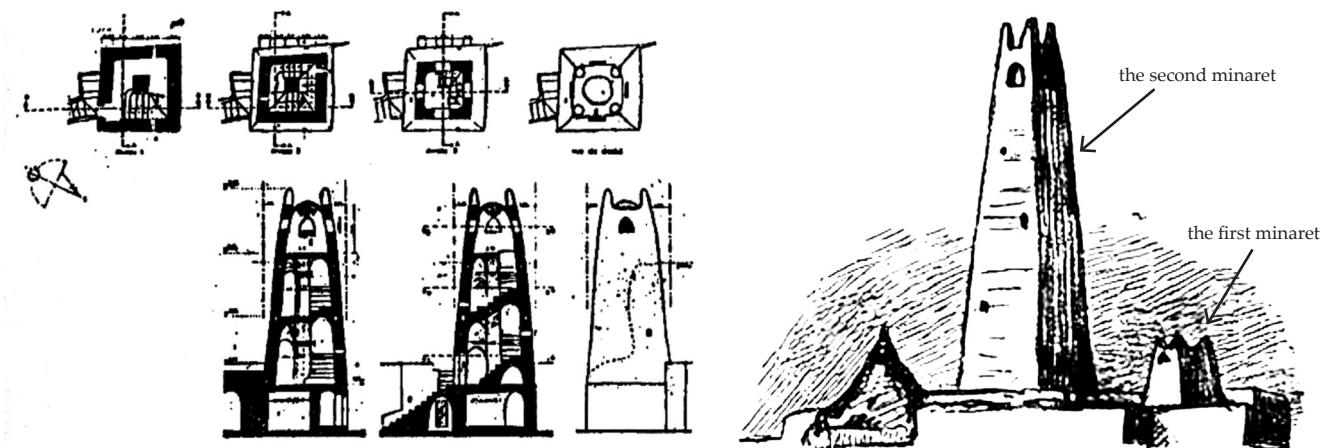
The spread of this minaret archetype in southern Algeria is considered to have given rise to local interpretations, as they are too striking and distinct from all the minarets in other regions of Algeria. As confirmed by Doutté (1900), the minarets are erected on a square-shaped base, which is thinning towards the top; the low strength of the materials does not give them a prismatic shape. Some have the shape of a real truncated cone. In the M'zab valley, for example, the high Saharan Berber style minarets distinguish more particularly the mosques (**Figure 4**). Conceived in the form of a very distinct elongated pyramidal shape, these minarets are the only way for the architect/builder to fit into a sober architecture (Prevost, 2011). In this respect, the M'zab builders may refer to certain aspects of sub-Saharan Sudanese architecture. This is explained, according to Rousseau (1934), by the fact that the ancient Berber tribes of the M'zab Valley were engaged in commercial exchanges with Sudan, which influenced the local constructive expertise of the M'zab community. The two minarets of the Ghardaïa mosque are among the oldest specimens illustrating this influence. According to the M'zab Valley Protection and Promotion Office (OPVPM), the first is robust and bulky, with a low height of no more than 6 m (**Figure 4**). The second minaret, erected in the 16th century, has a pyramidal shape raising to 23 m on a square base of around 6 m on each side (**Figure 5**). Mercier (1922) described this minaret in detail, noting that it has a typical ornamental top, culminating in four fingers raised to the sky. A heavy blocking pillar occupies the central inner part; between this pillar and the sides of the tower there is a staircase of 122 steps. The facades of the minaret are pierced with small arched openings, giving very little light during the ascent. In addition, when the Ksar of Ghardaïa was founded in the 11th century, the mosque was the first building to be built on the highest point of the hill to allow surveillance through its minaret which acted as a watchtower.

DIVERSITY AND SINGULARITY OF HISTORICAL FORMS: THE QUESTION OF STYLE AND CHARACTER

Figure 4. Plans and sections of the first Minaret of the Ghardaïa mosque. (Benyoucef, 1992).

Figure 5. Hand drawing of the second Minaret of the Ghardaïa mosque (Rousseau, 1934).

The concepts of style and character refer to the perception of an object and reflect its heritage values (aesthetic, historical and architectural value). In this regard, the process of perception of an object defines its basic characteristics, which make it distinctive from others; this determines its visual identity. The most important characteristics of each object are its



form, size, color, structure, material, position in space and its dynamism. (Alihodzic and Zupančič, 2018). The latter necessarily leads to the study of the relationship of the object's evolution (transformation and stratification) through history and the discovery of the factors that influence it. Identity in architecture depends not only on the composition of form and its physical features, but also on the notion of meaning and significance. This mental event mainly concerns images, ideas, concepts, thoughts and emotions (Baper and Hassan, 2010). Borie et al. (2006) emphasized that a form usually maintains a relationship of reference to another form or idea, and that it is impossible to explain the appearance of a form without referring to an archetype - or primitive model - of that form. This archetype develops over time and under the effect of different environmental, social, cultural, and even political factors, which give it morphological diversity.

Through a study of 19th and 20th century colonial heritage facades in Algiers, Chabi (2012) provided an in-depth analysis of the concepts of style and character, and related them to the diversity and singularity of historical forms. Chabi defined the style as a reference to the character of the architectural objects of the same period; this refers to the physical properties of the objects. It is through style that an observer distinguishes between buildings and determines their schools and/or period. Each style has elements and details that characterise it from the others. Thus, objects from the same period show absolute and/or relative similarities in details and decorative elements (Chabi, 2012). In the same manner, Chabi defines character as a quality that confers a singularity or personality on an architectural object and makes it distinct from other objects. Catjvet (1923) confirmed this property when he interpreted the typological diversity of the mausoleums cupola in the Maghreb territory. Catjvet emphasized that the subjective spirit and mentality of the designer, the degree of holiness of the figure to be buried, the imagination and wealth of the locals have an impact on their construction tastes. This demonstrates the impact of the immaterial dimension on the built form.

According to Farrag's research (2017), the production of mosques and Islamic centres is affected by certain man-made and natural factors. Based on the description and analysis of various examples in Africa, Asia, America and Europe, the author concluded that it is essential for many Muslim immigrants to use their architectural language to build mosques similar to those in their countries of origin. Furthermore, architectural style is affected by colonialism and by the person who finances the designs or manages the project. Climatic conditions, locally available materials and the pre-existing built environment also have a significant impact on the production of mosque architecture. Cultural exchanges between nations, traditions and know-how are another factor that has affected the morphological appearance of the mosques. Exchanges promote the circulation of ideas, practices and constructive techniques that are taken as such or incorporated into local traditions. By way of illustration, in a recent study conducted by Barbara and Molnár (2019), there are French colonial contributions in Algeria (1900-1950), some of which were a reinterpretation of forms of vernacular religious architecture, offering a distinct morphological and stylistic identity, respective to the local Muslim culture. The elements most frequently used by colonial architects during this period are the minaret, the dome, the arches, the cantilevered balcony, etc.

THE INDICATIONS RELATING TO THE ANCIENT MINARETS ARCHITECTURE IN THE ZIBAN

The indications on the historical sources of the ancient minarets of the Ziban are not abundant and prolix and do not allow to trace the styles and characters of these elements. In fact, the main constraint at this stage is the lack of historiography of mosques in the Ziban region, in particular of the architecture of the minarets, which makes it difficult to inventory them. According to records, the first mosque is that of Sidi Okba Ibn Nafaa, built on his tomb around the 7th or 8th centuries. This mosque was renovated several times; some of the renovations were not dated and it is difficult to provide exact dates and details. Its minaret was probably built after the mosque, and it may have been rebuilt in 1799-1900 by a Tunisian architect according to the inscription on the *mihrab*. Regarding its first morphology, there are no written or archival traces to verify its relevance as an archetype model. It has even been estimated that the minaret of the Sidi Okba mosque was not rebuilt, but rather redecorated. This minaret was built on a square base of 5m wide, with a pyramidal tower narrowing up to 3.5 m. Its decoration consists of intersecting semi-circular arches inscribed in rectangular niches. The minaret is crowned with merlons (**Figure 6**).

According to a popular oral narrative saying, there was a pre-Islamic Christian church in the Tolga sub-region. It is said that the church was transformed into a mosque by Okba Ibn Nafaa during the Islamic expedition to the Maghreb, but it is not known whether it had a tower and its actual morphological and stylistic features. In this context, Piesse (1882, 421), relying on the descriptions of Arab historians and geographers, argued that Tolga was Roman and had a castrum with six well-preserved towers in which Saharan buildings were entangled. However, this note is no longer valid today since most of the old built traces of construction have disappeared. The most plausible hypothesis is that the inhabitants of the Ziban adopted and developed Kairouan's minaret during the first centuries of Islam, but with some rather striking features summed up in its massive shaft (tower): a prismatic volume erected on a square base. Subsequently, it is believed that the architecture of the minarets evolved towards a pyramidal shape, like the Berber Ibadi minarets of the M'zab Valley, but to



Figure 6. Overview of the Sidi Okba mosque (Delcampe, n.d.)

date, research that could confirm this hypothesis is still scarce and almost non-existent.

It also seems that the soul, personality and even social affiliation of the builders influenced the architecture of the minarets. In fact, the Ziban region has historically been a set of oases linked to traffic networks, frequented by trans-Saharan caravans and trade movements, as well as by immigrant builders who probably brought their own constructive culture with them. Around the 8th century, the modification of the main trade routes in Africa led to the foundation and proliferation of countless Saharan cities (Côte, 2009). Considering that mosques were at the heart of daily religious activity, they were usually preeminent elements in the arrangement of Muslim settlements and cities. In the medieval era, the Ziban was well known as a place of scientific and cultural prominence as well as a centre of religious influence with many places of worship. Unfortunately, with time, the local memory and oral tradition relating to the heritage mosques have faded away. It is therefore difficult, if not impossible, to reconstruct historical facts and material traces that could help to better understand the heritage of these buildings, whose existence dates back to the medieval period.

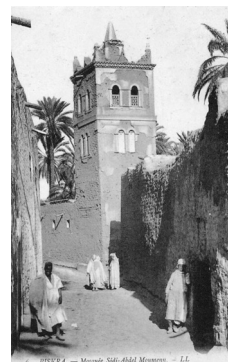
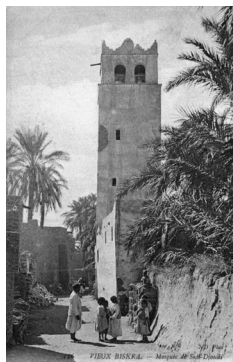
Despite the scarcity of historical records, some of the Ziban minarets have been mentioned by authors in travel accounts, particularly those from the French colonial period. The minarets were described as towers through which tourists climbed to get an overview of the Ziban oases. In an important work *“Biskra sortilèges d’une oasis”* published simultaneously by the Paris Arab World Institute and the National Museum of Modern and Contemporary Art in Algiers, Roger (2016) briefly describes some of the heritage mosques in the Ziban. This art historian mentioned that all the minarets of the old Biskra are square and have tiny rectangular windows to illuminate the inner stairway that the Muezzin used to climb to call for prayer from the balcony. They have three to seven storeys in height and have a gallery with two large openings, pierced on four sides. These minarets have four corner merlons accentuating their verticality and giving them a fortified appearance like a gat tower. Roger added that the Sidi Abd Al-Moumen mosque minaret has always drawn a lot of attention; its intricate decor has aroused the interest of Albert Ballu (a famous French architect) and many photographers. To a distant observer, the minarets of the old part of Biskra show formal and stylistic similarities; they were built with adobe and palm wood according to the same local logic (**Figure 7**), (**Figure 8**), (**Figure 9**), (**Figure 10**).

Figure 7. Minaret of the Sidi Moussa mosque (Delcampe, n.d.)

Figure 8. Minaret of the Sidi Djoudi mosque (Delcampe, n.d.)

Figure 9. Minaret of the Sidi Abd Al-Moumen mosque (Delcampe, n.d.)

Figure 10. Minaret of the Sidi Ben Fadhel mosque (Photographes De Biskra, n.d.)



2. Citation in French, translation by the Authors: "[...] its minaret, pierced with numerous openings, is narrowing like an obelisk or a steam factory chimney [...]. The architect of this mosque is a man named Mohammed ben-Mahallen".

In a paper on Berber architecture, Godlvin (1989) examined the variety and singularity of certain minarets in the Ziban and highlighted their particularities. The author noted that the minaret of Doucen has the form of a high four-sided pyramid. The minaret of the Al-Atik mosque in Bordj-Ben-Azzouz, which, on a square base of burnt bricks, has a tower in the shape of a polygonal prism extends by a cylinder carrying a balcony. In addition, Roger (2016) reported the formal similarity between the minarets of the Doucen, the Ouled-Djallel and the Djemaa Al-Kebir (great Mosque) located in the Turkish Kasbah of old Biskra (**Figure 11**), (**Figure 12**), (**Figure 13**), (**Figure 14**), (**Figure 15**). The minaret of the Djemaa Al-Kebir is a square tower on which a spiral staircase is climbed, the whose steps, contrary to the usual building practices in this region, are lower (Cataldo, 1954). Regarding the Berber architecture in southern Algeria, Rousseau (1934) gave the specificity of the Ouled-Djallel minaret by specifying that it is a mixture of Berber and Arabic styles and it has a square lantern. Its silhouette is reminiscent of the minaret of the M'zab Valley (**Figure 5**), (**Figure 12**). As for Piesse, the researcher alluded to the peculiar form of the minaret of the Bouchagroun mosque:

"[...] son minaret, percé de nombreuses ouvertures, va en s'amincissant comme un obélisque ou une cheminée d'usine à vapeur [...]. L'architecte de cette mosquée est un nommé Mohammed- ben-Mahallen." (2) (Piesse, 1882, 420)

In 1861, Thierry-Mieg entered the minaret of an old mosque in the village of Outaya and described in detail the passage he took to reach the balcony for an overview of the oasis landscape. The traveller had to follow a very narrow winding stairway so low that one could only walk up it curved in two. In addition, the steps of the minaret were made of palm branches covered with their bark and were so high that the strides became extremely painful and so narrow that one could only put on one's toes on the way up and one's heels on the way down. This textual explanation conveys not only the architectural aspects of the minaret, but also the sensation of climbing to its top. Here, the subjectivity of the author has been expressed with frankness, feeling and sensitivity.

Figure 11. Hand drawing of the Djemaa Al-Kebir in the Turkish Kasbah of old Biskra (1541-1680) (Pizzaferrì, 2011).

Figure 12. The minaret of Ouled Djallel mosque (Algerian Ministry of Culture and Information, 1970).

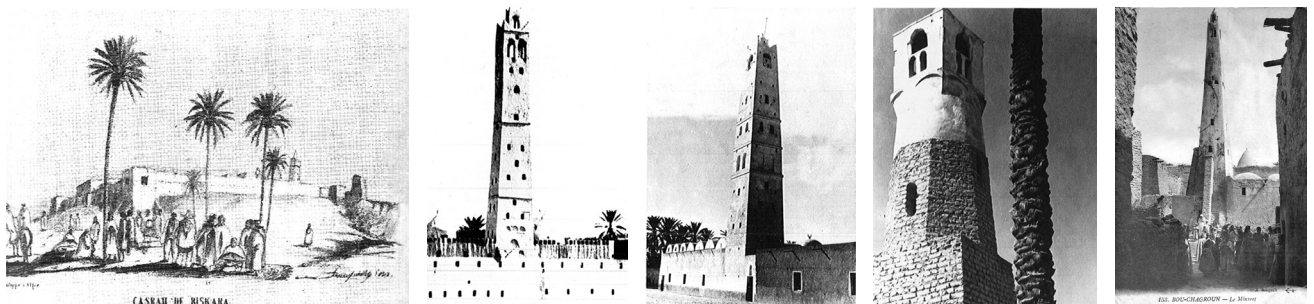
Figure 13. The minaret of Doucen mosque (Algerian Ministry of Culture and Information, 1970).

Figure 14. The minaret of Al-Atik mosque in Bordj-Ben-Azzouz (Algerian Ministry of Culture and Information, 1970).

Figure 15. The minaret of Bouchagroune mosque (Gallica, n.d.)

CATEGORISATION OF THE ANCIENT MINARETS IN THE ZIBAN: ANALYSIS AND INTERPRETATION

There is no doubt that the morphology of the Ziban minarets has certainly evolved in accordance with the historical evolution of the region and under different conditions. Nevertheless, before describing their morphological categorisation, it would be useful to describe them briefly, giving some of their main features. The first point to note is that the majority of the Ziban minarets occupy corner positions in the overall plan of the mosque.



The minarets are built on an approximately square plan and are elevated more than 10 m above the ground. In morphological terms, these minarets consist of three segments piled on top of each other: a shaft (tower), a gallery (balcony) and a lantern. Thus, the silhouette of the minarets is determined by the variation of the three basic segments. It should be noted that, contrary to the general archetype of the minaret, there is no basement in the Ziban minarets. The mosques of the Ziban region have only one minaret. The latter is a strongly united volume that ends in a balcony in the form of a covered terrace. On the four sides of this balcony, there are two adjacent openings which are used by the *muezzin* to diffuse his voice during the call to prayer. And as the balcony is not a cantilever, its threshold is marked on the facades by simple protruding lyses which visually separate it from the shaft (tower) of the minaret. Sometimes there is no separation between the two segments (balcony and shaft) of the minaret. In this case, the observer can distinguish the balcony from the shaft through the two openings in the balcony. Most often, the covered balcony is topped with a lantern to provide more daylight and natural ventilation, but in all cases the *muezzin* remains protected from the sun. With the arrival of the French colonizers and their demolition/reconstruction actions, the two segments (balcony and lantern) underwent a significant evolution: the balcony was then opened and the lantern was inserted into it (Table 1).

Comparative morphological analysis applied to a set of representative minarets in the Ziban region indicates that the main criterion for distinguishing them is the configuration of the shaft; precisely the external contour of their shaft (tower), i.e., the silhouette. This classification criterion also includes the dimensional relationship between the base and the top of the tower (the threshold of the balcony) as well as its height. Thus, by classifying the minarets of the corpus studied according to the formal attributes of the shafts, four morphological types were identified: the pyramidal minaret, the prismatic minaret, the cone-shaped (or obelisk-shaped) minaret and the hybrid-shaped minaret.

- **Pyramidal minarets:** are very slender; their facades have non-vertical faces; they narrow upward and often have a balcony overlaid by a lantern. Due to their pyramidal shape, only one person can pass through them. The minarets of the Ouled-Djallel and Doucen mosques are examples of this type (Figure 12), (Figure 13).
- **Prismatic minarets:** were built on a square base, they are distinguished by their robust appearance and relatively reduced height compared to the pyramidal minarets. Prismatic minarets often do not have a lantern above the balcony. The latter is covered by a small, slightly pointed cupola or a flat roof with a pinnacle. There are many mosques with this type of minaret; the Sidi Massoud in Chetma and the mosques located in old Biskra are the most expressive (Figure 7), (Figure 8), (Figure 9), (Figure 10).
- **Minaret cone-shaped (or obelisk-shaped):** is a unique model of this type of minaret is the one of the Sidi Issa Ben Amour mosque in Bouchagroune. It was built with adobe and is still preserved in spite of the floods which led to the collapse of this mosque in 1969. Little is known about the architect of this mosque and the origin of Sidi Issa; only his religious piety and wisdom made him popular in the locality. It is believed that this minaret was inspired by the Saharan-Berber mosques but with particular features. The

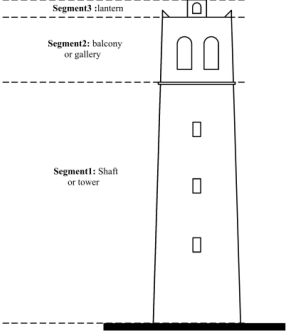
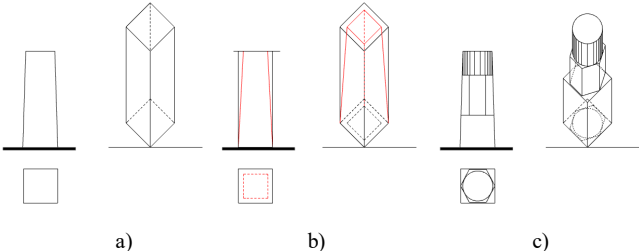
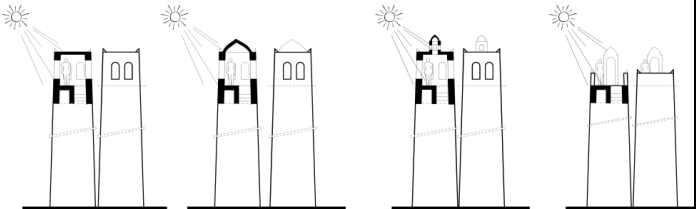
Segmentation/ variation	Illustrations
<p>Segmentation of minaret architecture in the Ziban</p>	 <p>Segment 1: Shaft (Tower); Segment 2: Balcony (Gallery) And Segment 3: Lantern</p>
<p>Elevation and axonometry showing the variations of the segment 1: shaft (tower)</p>	 <p>a) Prismatic volume; b) Pyramidal volume; c) Hybrid volume (combination of forms)</p>
<p>Section and elevation showing the variations of segment 2/3: balcony (gallery)/lantern</p>	 <p>a) End balcony; b) Covered balcony without lantern; c) Covered balcony with lantern; d) Open balcony with lantern</p>

Table 1. The variation of different segments of minarets in the Ziban Region (Developed by authors)

triangular buttress used to support loads of the minaret is foreign to the Ziban building technique; it is widely used in the M'zab valley and in the Algerian Souf habitat with the domed roof system. The obelisk-shaped minaret is a high, four-sided minaret tapering upward. It ends in a covered balcony with a lantern at the top. This type differs from pyramidal minarets in its height relative to the dimensions of the base, giving it the appearance of an obelisk (Figure 15).

- **Hybrid minaret:** the most expressive example is the Al-Atik mosque minaret in Bordj-Ben-Azzouz (17th century). Its shaft morphology consists of a superposition of three volumes: prismatic - on a square base-, polygonal and cylindrical. It is a combination of

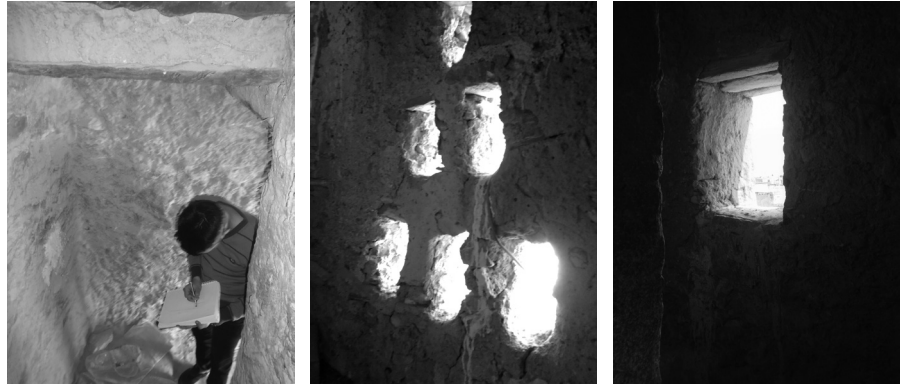


Figure 16. Interior views of the Dachra mosque minaret in Sidi Khaled village

Ottoman and Maghreb styles, marked by local influences. The 1969 floods destroyed this minaret because it was built with adobe (Figure 14).

The minarets of the Ziban, irrespective of their morphological affiliation, present from the inside a structure defined by an ascending stairway (non-hollow) that rotates around a square core (heavy pillar) not exceeding 1.5 m on each side. In the section, the stairway is too narrow to allow the passage of more than one person. Prismatic minarets are relatively larger than the pyramid ones. Lighting is provided naturally through the small openings that punctuate the shaft of the minarets. These openings give the minarets a vertical rhythm. In addition, the two adjacent openings of the balcony are constantly present in the minarets with covered balconies (Figure 16), (Figure 17).

Based on the geographical distribution of all the morphological types of minarets in the Ziban region, it appears that the prismatic minarets are mainly located in the Central Zab (Biskra) and the *Chegui Zab* (Eastern Zab). Pyramidal minarets can be found in the far of the *Geubli Zab* (Southern Zab). There is a combination of two morphological typologies in the *Dahraoui Zab* (Northern Zab), those of pyramidal and prismatic minarets. The obelisk-shaped and hybrid minarets are the only ones that stand out from the other minarets; they exhibit their distinguishable character. Exhaustively, these notes confirm that the morphological types of minarets are mainly distributed according to geographical areas where the form, style or character of the pre-existing minaret influences the architecture of the posterior minarets (Figure 18). This finding justifies their similarity and categorisation into morphological types.

Figure 17. Exterior and interior views of the covered balcony of the Dachra mosque minaret in Sidi Khaled village

Apart from the corner merlons and the rhythm of the openings, the minarets are sober and devoid of any particular ornamentation; they have



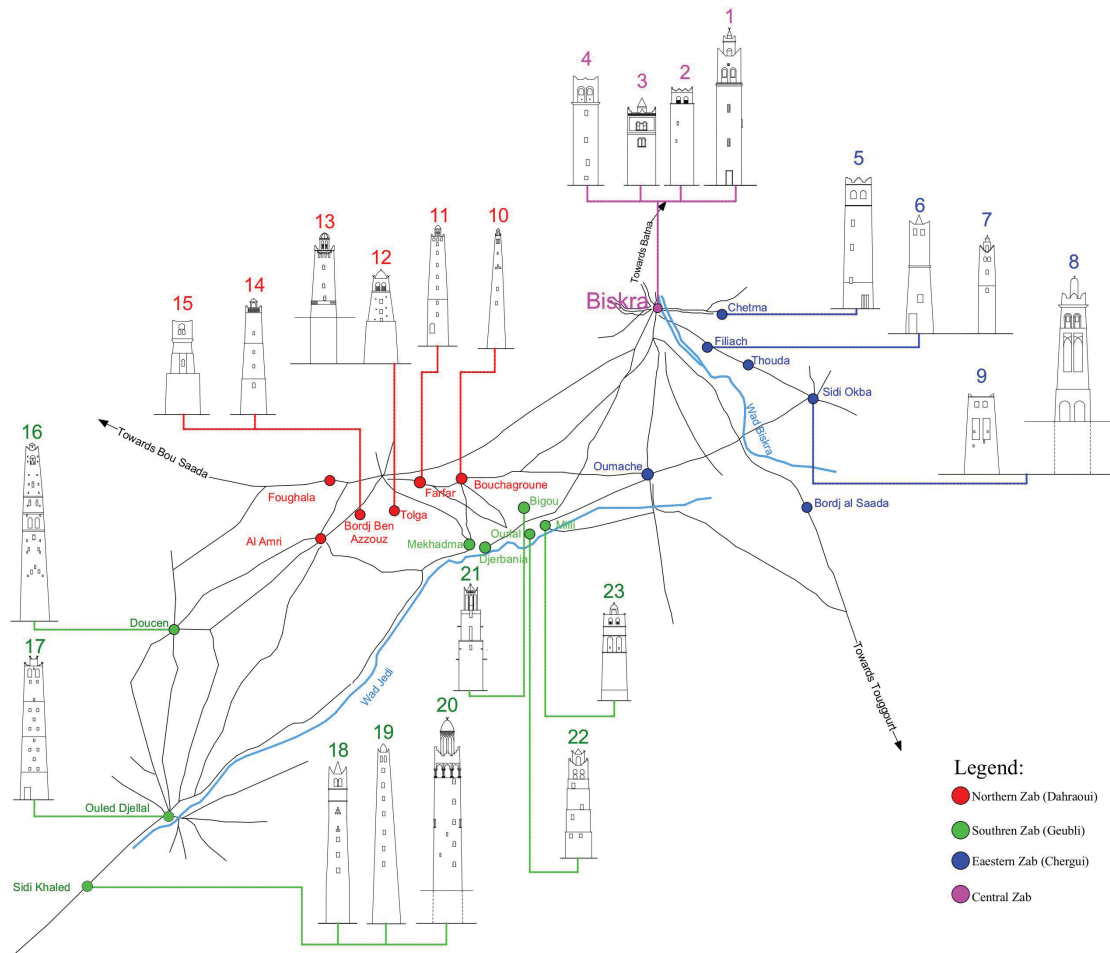


Figure 18. Geographical distribution of the morphological types of the minarets in the Ziban (Drawn based on the following available sources a) ancient postcards, b) the archives of the Culture Direction of Biskra and c) architectural surveys performed in 2018).

1) Sidi Moussa mosque after reconstruction (1954); 2) Sidi Djoudi mosque (12th-14th centuries); 3) Sidi Abd Al-Moumen mosque (12-14th century); 4) Sidi Ben Fadhel mosque (13th century); 5) Sidi Massoud mosque (9th century); 6) Feliech mosque (before 19th century); 7) Feliech mosque (19th-20th centuries); 8) Sidi Okba mosque (7th-8th centuries and rebuilt in 1799-1800); 9) Sidi Al-Haffi mosque (15th century); 10) Bouchagroune mosque (14th century); 11) Farfar mosque (1913); 12) Al-Atik mosque in Tolga (before the 19th century); 13) Al-Atik mosque in Tolga after reconstruction (at the beginning of the 20th century); 14) Bordj-Ben-Azzouz mosque (1907-8); 15) Al-Atik mosque in Bordj Ben Azzouz (17th century); 16) Doucen mosque (1927); 17) Ouled Djellal mosque (15th century); 18) Dachra mosque in Sidi Khaled village (16th century); 19) Sidi khalid Ibn Sinan mosque (around 16th century); 20) Sidi khalid Ibn Sinan mosque after reconstruction (1925); 21) Sidi Abd Al-Rahmane mosque (before 19th century); 22) Ourlilal mosque (1930); 23) Mlili mosque (before 19th century)

only lyses and/or blind niches. In this case, it is preferable to consider form as an expression of style and character. Nevertheless, the minarets of the Ziban are morphologically linked to those of the Maghreb and the Saharan-Berber minarets. A careful analysis of the different minarets also reveals that the corner merlons were designed in varied and specific geometric patterns; they were usually shaped with steps tapered or triangular patterns. The pinnacle, if there is one, is most often in the shape of a crescent and star, placed at the top of the minaret. Thus, the balcony and lantern of each minaret are visually the most attractive segments of its architecture and constitute identity segments compared to all the minarets in Algeria and in the south in particular (**Figure 19**), (**Table 1**).

From a chronological point of view, there is no clear and certain prove illustrating a stable relationship between age and the morphological typologies of minarets in the Ziban. According to the data collected, it is generally believed that the prismatic minarets were the first to appear, followed by pyramidal minarets around the 14th and 15th centuries. This corresponds to the appearance of different human settlements in the different sub-regions of the Ziban, where the mosque with its minaret played an organizing role in the urban Muslim fabric. The hybrid minaret corresponds to the period of Ottoman presence in the Ziban region. However, this type did not have a wide regional diffusion, as the regency was not deeply established in the Ziban like the cities of northern Algeria,

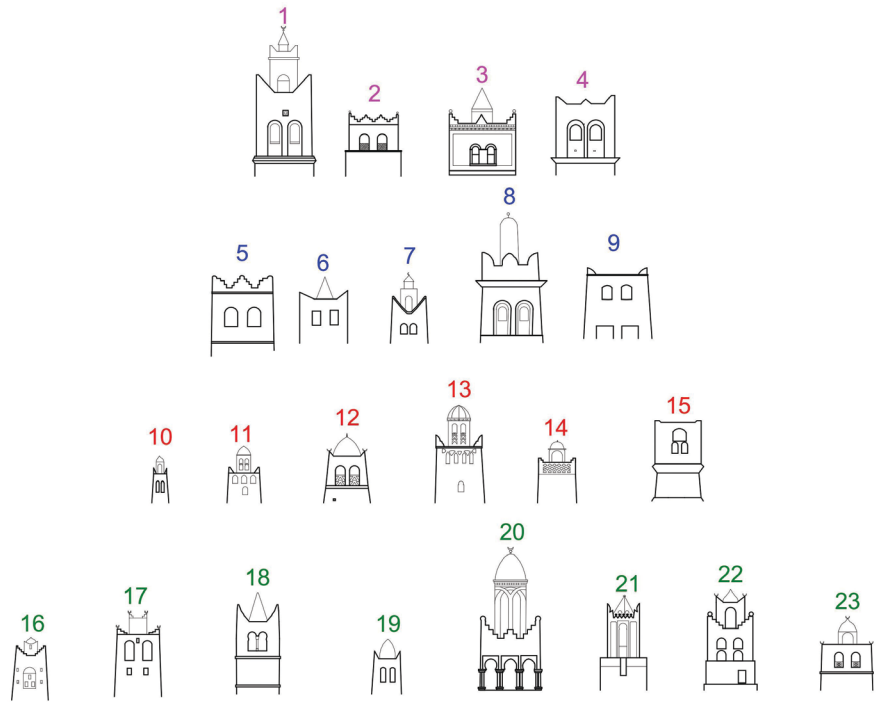


Figure 19. Details of the segments 2/3 (balcony/lantern) of the minarets in the Ziban. (Drawn based on the following available sources a) ancient postcards, b) the archives of the Culture Direction of Biskra and c) architectural surveys performed in 2018).

where the Ottoman style is strongly expressed in the architecture of the mosques. Moreover, the domination rule in Algeria left a certain freedom to the southern regions which it controlled, but in return the regent used relentless methods to collect taxes from the local inhabitants once a year. This prevented the imposition of an Ottoman style in which the inhabitants continued their constructive culture in the different sub-regions of the Ziban.

Moreover, interventions on the architecture of mosques are a factor that makes it difficult to read and inventory the form, style and character of the minarets. A large number of them were restored, transformed, and even demolished/rebuilt around the 20th century, corresponding to the French colonial period. Most likely, European architects were involved in all these operations on the minarets of the Ziban. For example, the minaret of the Al-Atik mosque in Tolga was rebuilt, as indicated by the comparison of two old photographs taken at different times. It was, for the first time, of a robust size and had a balcony covered with a small pointed cupola. There were two openings on all four sides of this balcony, each ending in a semi-circular arch; they were used by *muezzin* to make a call to prayer. After the reconstruction work was carried out, the minaret became quite high and slender, with an open balcony where the 4.27-m-high lantern was superimposed (**Figure 20**), (**Figure 21**). The reconstruction operation affected not only the size of the minaret, but also its fundamental morphological segments. The builders changed the covered balcony, which characterizes the old minaret with an open balcony, despite its inadequacy for the hot summer sun, which can affect the *muezzin* during the call to prayer. The rebuilt minaret still retains its original charm (the rhythm of the opening, the corner merlons and the pyramidal appearance), but the addition of a lantern with an open balcony was not common in the Ziban region. It seems that the reconstructed minaret of the Atik Mosque in Tolga quickly influenced a later minaret; the inhabitants adopted it as a reference



Figure 20. Minaret of the Al-Atik mosque in Tolga before its reconstruction (Delcampe, n.d.)

Figure 21. Minaret of the Al-Atik mosque in Tolga after its reconstruction (Delcampe, n.d.)

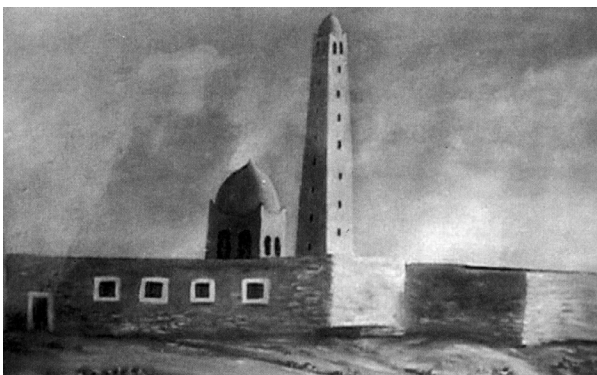
Figure 22. Minaret of Bordj-Ben-Azzouz mosque (Delcampe, n.d.)

for the minaret of the Bordj-Ben-Azzouz Mosque in 1907-8 (**Figure 22**). The disappearance of the covered balcony is noted in this example.

The minaret of the Sidi Khalid Ibn Sinan mosque illustrates the same action (demolition/reconstruction) as in the previous sample. The Sidi Khalid Ibn Sinan mosque was damaged by the flooding of the Wad Jedi during the heavy rains of 1912 and was rebuilt in 1925 by Amar Al-Soufi Gaga from the Souf region. This builder kept the same spatial organisation of the old mosque and, with a new stylistic taste, modified its form. The minaret is therefore not authentic; it bears a Maghreb-style minaret with a particular twist that reflects the spirit and mentality of the builder. It has an open balcony with a high square lantern. The facades of the minaret are vertically pierced with horseshoe shaped arched openings, used for lighting the staircase; they are also decorated with a blind arcade supported by balustrades. Merlons in the form of tapered steps at the end culminate the balcony. In addition, crossed arches support a lantern surmounted by a pointed cupola (**Figure 23**), (**Figure 24**), (**Figure 25**). In 1999, the Ministry of Culture classified the Khalid Ibn Sinan mosque as a national historic monument due to its heritage value. It is currently in the process of restoration and rehabilitation.

Figure 23. View of the Khalid Ibn Sinan mosque before rebuilding (The archives of the Culture Direction of Biskra).

Figure 24. View of the Khalid Ibn Sinan mosque after rebuilding (The archives of the Culture Direction of Biskra).



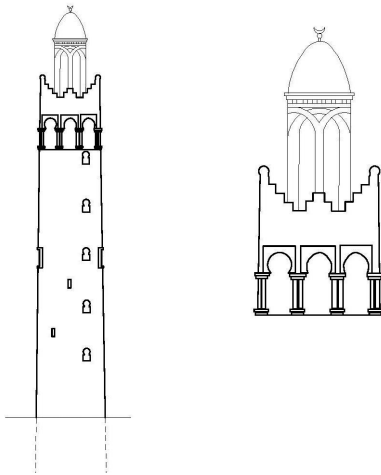
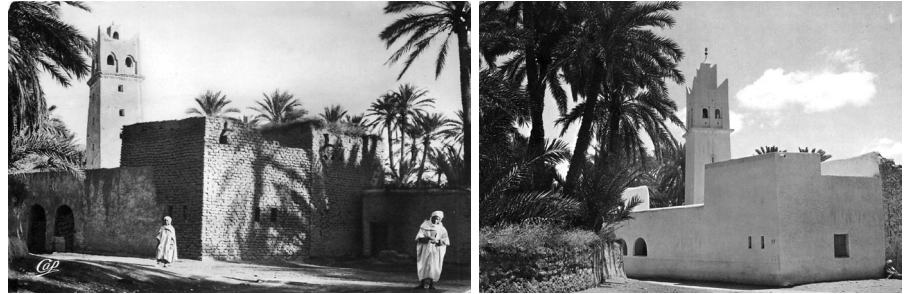


Figure 25. Decoration detail of the Khalid Ibn Sinan mosque minaret after reconstruction (Drawn according to the archives of the Culture Direction of Biskra).

Figure 26. The Sidi Moussa mosque before the rebuilding of 1954 (Delcampe, n.d.)

Figure 27. The Sidi Moussa mosque after the rebuilding of 1954 (Delcampe, n.d.)

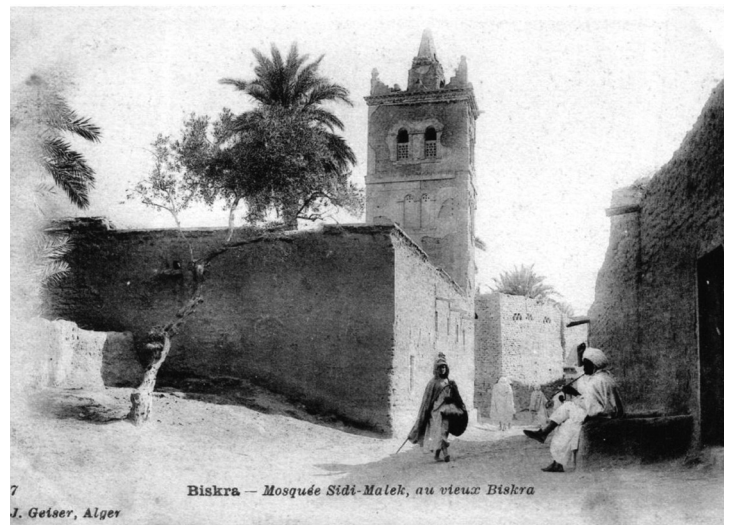
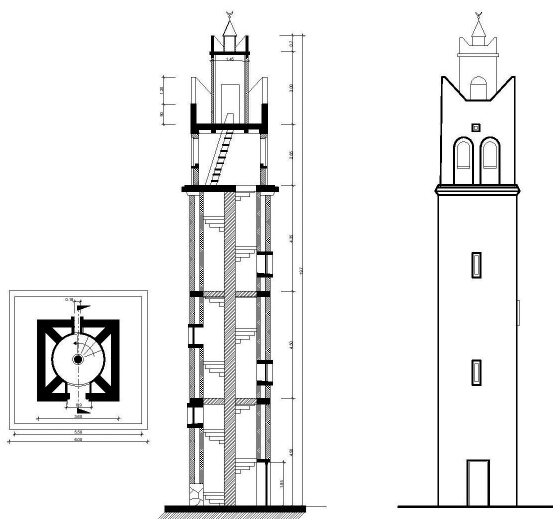


Due to the fragility of traditional building materials, the old Biskra mosques have been restored several times in the course of history. For example, the minaret of the Sidi Moussa mosque was rebuilt at least twice. The first reconstruction took place in 1727 by the Ottomans, but no data on an earlier appearance of this building could be obtained. The second was done in 1954; it remains relatively in the same style of the old minaret which was rebuilt after the demolition in 1727 (**Figure 7**). The difference, however, appears mainly in the openings in the minaret shaft, the height of the lantern and the parapet wall. The minaret was rebuilt using modern reinforced concrete construction techniques and has a spiral staircase (**Figure 26**), (**Figure 27**), (**Figure 28**). The second demolition/reconstruction seems more conservative than those of the Al-Atik mosque in Tolga and the Sidi Khalid Ibn Sinan mosque. As for the minaret of the Sidi Abd Al-Moumen mosque, its restoration removed the original decoration of the facades and changed the pinnacle form (**Figure 29**) (**Figure 30**) (**Figure 31**); it has now disappeared.

Figure 28. Plan, section and elevation of the Sidi Moussa mosque minaret after reconstruction project in 1954 (Drawn according to mosque's archive).

Figure 29. Degradation of the Sidi Abd Al-Moumen mosque minaret facades (Delcampe, n.d.)

During the French colonial period, the construction of religious buildings was not encouraged. Few mosques were built. The two examples detailed in this study, the Gaid mosque (1890) and the Bakkar mosque (1913), were built in the French city of Biskra and were financed by local notables or/and influential personalities. In 1890, Sheikh Al-Arab Bouaziz Bengana received the French authorisation to build the first mosque in the French area. The building was intended for Muslim residents recently settled in the French city. This mosque, called the Gaid mosque, was built on a piece of land belonging to Sheikh Al-Arab and covers an area of 2,000 m². The



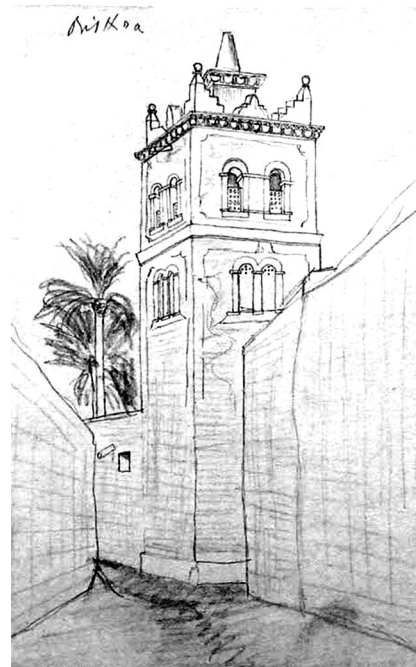
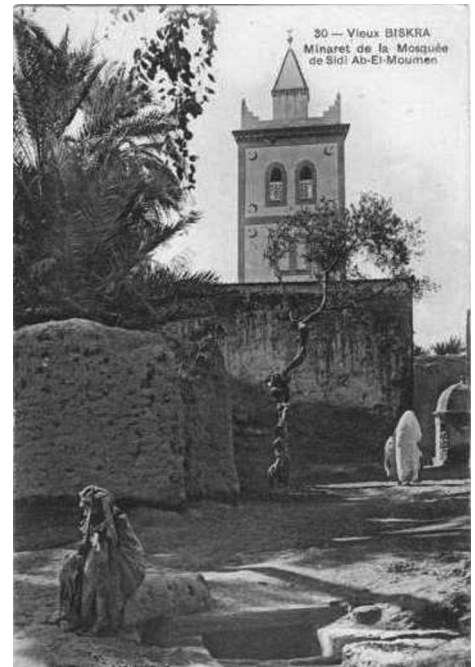


Figure 30. Decoration detail of the Sidi Abd Al-Moumen mosque minaret drawing by Albert Ballu around 1890 (Roger, 2016).

Figure 31. View of the Sidi Abd Al-Moumen mosque minaret after restoration (Delcampe, n.d.)



contribution of its minaret to the morphological diversity of the Ziban lies in an analogy with that of the Sidi Abd Al-Moumen mosque minaret in the old Biskra. The latter was used as a model for the construction of the Gaid mosque minaret, probably because of its stylistic value which distinguished it from the other minarets of the old Biskra. The construction of the minaret and the choices made regarding its appearance were largely inspired by the vernacular buildings. Built with traditional materials such as adobe and palm wood, the minaret has deteriorated over time and rebuilt at least twice. Before 1933, the minaret was demolished and rebuilt in a very different style and form; it was also higher than the authentic one. A few years later, in 1941, another reconstruction operation was carried out on this minaret, as confirmed by written documents found in the municipal archive of Biskra. Unfortunately, the two rebuilt minarets have no relationship with the authentic one (**Figure 32**), (**Figure 33**), (**Figure 34**). Recently, the mosque with its minaret was once again completely rebuilt by the local authorities after its demolition.

In 1913, Razigue Bakkar, a notable from Souf region (south of Algeria), decided to build a mosque in Biskra. It was officially inaugurated at the beginning of 1914 and was called the Bakkar mosque. Over time, this mosque has undergone remarkable stratifications: its minaret was elevated by the addition of a new part to the top during the French colonial period, the wooden balcony was removed and only the joists still attest to its existence and, finally, a floor (first level) was recently built to serve as housing for the imam. Unfortunately, this addition has roughly affected the silhouette of the minaret, which seems to be lower. In its original form, the Bakkar mosque minaret presents a stylistic variation if compared to the other minarets of the Ziban. The difference is apparent precisely in the use of an open cantilever balcony that revolves around the entire minaret (**Figure 35**), (**Figure 36**), (**Figure 37**). Clearly, this element was reinterpreted from the architectural vocabulary of the pre-existing façades of Ouled Nail dwellings. Ouled Nail belongs to a population of nomadic tribes, some



Figure 32. Authentic minaret of the Gaid mosque (Delcampe, n.d.)



Figure 33. Minaret of the Gaid mosque after the first reconstruction (Delcampe, n.d.)

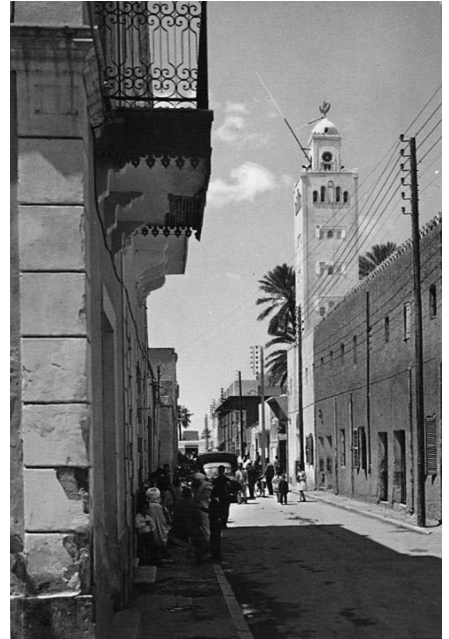


Figure 34. Minaret of the Gaid mosque after the second reconstruction (Delcampe, n.d.)

Figure 35. The Bakkar mosque minaret before its transformation (Delcampe, n.d.)

Figure 36. The Bakkar mosque minaret after transformation (Delcampe, n.d.)

Figure 37. The Bakkar mosque minaret after removing the wooden balcony (Delcampe, n.d.)

of whom settled in Biskra. Not far from the market square in the French city centre of Biskra, the Ouled Nail street is remarkable by its aligned and almost identical facades from which cantilevered wooden balconies emerged. Cantilevered wooden balconies did not exist in the old Biskra, where dwellings had blind facades to give the occupants more privacy (Figure 38), (Figure 39).

Due to its significant role and symbolism in Muslim culture and in the traditional urban landscape, the minaret was used as a pastiche element; even though there was sometimes a functional need to build a tower, it was designed by colonial architects in the form of a minaret to create architecture close to the traditions of the local population. The





Figure 38. View of an old Biskra street (Picclick, n.d.)



Figure 39. View of Ouled Nail street (Delcampe, n.d.)

Royal Hotel (1895) and the real estate investment project (1935) are two expressive examples of this cultural and architectural phenomenon (Figure 40), (Figure 41). Minarets were used, although these buildings have no relationship with Islam. Countess Le Marois commissioned the establishment of the largest and most sumptuous hotel of the French colonial period, known as the Royal Hotel; it has a universal reputation. Located in the French city of Biskra, this oriental-style building was surmounted by a 27-m high minaret-shaped tower. It consists of three superposed square towers, of decreasing widths, the last of which is topped with a cupola. This minaret resembles the local square minarets and, in particular, its triangular corner merlons. However, this way of superposing volumes was not conventional in the Ziban; it can be seen in the ancestor minaret of the Kairouan mosque (Figure 3). In functional terms, the hotel minaret included a slightly lower *belvedere*, from which one could enjoy a magnificent panoramic view of the palm groves that extended beyond the city. And as minarets were used in colonial buildings with no connection to Muslim culture (especially the cult), the hotel had large halls and lounges, restaurants, cafes, a smoking room, a billiard room, a banquet hall, a

Figure 40. Overview of the Royal Hotel (Delcampe, n.d.)

Figure 41. Overview of the Algerian bank (Delcampe, n.d.)



rotunda surrounded by tea gardens, cellars where the best vintages were kept, etc. Originally, the second example was an investment property that it operated as an Algerian bank in 1958. Its minaret serves as a stairwell to reach the different levels of that building. A strip of faience with geometric patterns girds the end of the tower. The minaret has a lantern surmounted by a cupola. Unlike the Royal Hotel, which was demolished in the 80s, the bank is still preserved today.

From an architectural point of view, the colonial stylistic contribution of an Arab-Muslim aspect seems quite conservative. It has in fact enriched the architecture of the ancient minarets and given it a new soul, despite its pastiche-like use, which may be quite incompatible with the precepts of Islam. As a factor foreign to the local culture, colonialism can lead to stylistic variations from the conventional style of the colonised region. This is justified by a change in the constructive culture, including the subjective spirit and tradition of the designer, as well as by the progress of the constructive procedures, which are certainly reflected in the construction process. Towards the end of the 19th century, the balcony of the minarets underwent a remarkable evolution under the influence of French colonisation: the balcony was opened and the lantern inserted into it (Table 1), (Table 2), (Figure 23). These findings reinforce the thesis that cultural exchanges between countries, traditions, expertise and others, such as colonialism, lead to morphological and stylistic variations. Thus, the colonial style can be an entirely new expression or simply a reciprocal interpretation of the existing local style specific to the colonised region.

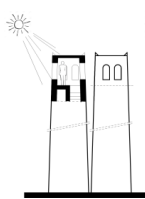
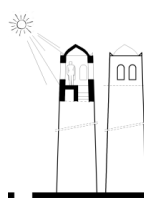
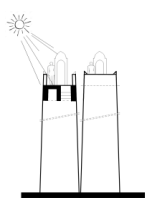















Periods	7th -14-15th centuries	14-15th -20th centuries	20th century - 1962	
Balcony types (segment 2)	Covered balcony		Open balcony	
Presence /absence of the lantern (segment 3)	Without lantern	With lantern	With lantern	
Section and elevation of balcony/ lantern (segments 2/3)				
Samples with identification number according to Figure 19	    	   	  	  

Table 2. Chronological evolution of the segments 2/3 (balcony/lantern). (Developed by authors)

CONCLUSION

The minaret is an important element of mosque architecture; it is used to call the believers to prayer five times a day. In various forms, styles and characters, the minaret has become a symbol of Islam and the Muslim community. This research focused on the morphological specificities of the architecture of ancient minarets in the Ziban region. It aimed to explore the stylistic attributes of these minarets and to trace the origins of their morphological diversity. The methodology adopted was based on a comparative morphological analysis that was applied to a set of minarets representative of the Ziban region. As a result, the study revealed that the main criterion for distinguishing the minarets studied from each other is the configuration of the shaft. Thus, by classifying the minarets according to the formal attributes of their shaft; the minaret can be pyramidal, prismatic, conical (obelisk-shaped) or hybrid-shaped (a combination of forms). The findings illustrate the diversity of local construction and historical influences on minaret architecture. Nevertheless, they are morphologically linked to those of the Maghreb and to Saharan-Berber minarets.

The study also summarized the factors that influence the morphology the minarets architecture in the Ziban region. The local culture, expertise and social belonging of the builders, in a broad sense, have an impact on their soul in the construction typology. The pre-existing minaret is a source of inspiration for the production of posterior minarets. This conclusion is confirmed by the morphological similarity between them and by the approximation of their geographical distribution. The reinterpretation of the pre-existing building vocabulary, such as the minaret of the Bakkar mosque, where the cantilevered balcony was inspired by the Ouled Nail dwellings. Furthermore, cultural exchange has an impact on the diffusion of building traditions and techniques, such as the French contribution. This affects the conventional style of the Ziban region. The taste of the period is reinforced by the intervention operations on the minarets such as the demolition/reconstruction of the Al-Atik mosque in Tolga, the Sidi Khalid Ibn Sinan and the Gaid mosques.

This research can be extended to include the architecture of the Ziban mosques as a whole, taking into account the fact that, until now this type of building has been neglected and even undocumented. Future studies can explore the morphological specificities of their organisational patterns and compare them with known Islamic architectural typologies. Meanwhile, the findings of this study could be used to guide the development of principles for the design of minarets that respect the architectural identity of the Ziban. To this end, there are many opportunities to revive the Muslim religious heritage and reintroduce it as a linking tool between past and present.

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Anahtar Sözcükler: Minare; Ziban; morfolojik analiz; morfolojik tipler; üslup katkıları.

ZİBAN BÖLGESİNDEKİ (CEZAYİR) ANTİK MİNARELERİN MORFOLOJİK ÇEŞİTLİLİĞİ: BİÇİM, ÜSLUP VE KARAKTER SORUNU

Minare, ezana çağrındaki rolü sebebiyle dünyadaki en güçlü İslam sembollerinden biridir. Tarih boyunca, insan yerleşimlerinde caminin varlığına işaret etmiştir. Temelde bir minare dört ana kesitten (bölüm) oluşur: bodrum, gövde, şerefe (müezzinin ezanı çağırdığı platform) ve tepe veya fener. Mimarlar, bu temel bileşenleri kullanarak, ustaca birleştirip işlemiş, ve böylece bölgeye ve inşa edildikleri döneme göre değişen geniş bir morfolojik minare çeşitliliği oluşturmuşlardır. Bu makalenin temel amacı, bu çeşitliliğin kökenini anlamak için, Cezayir'in güney doğusunda bulunan bir Sahra bölgesi olan Ziban'daki eski minare mimarisinin biçim, üslup ve karakter sorusunu incelemek ve analiz etmektir. Çalışmanın metodolojisi, veri toplama aracı olarak literatür taramasına, ikonografik belgelere, mimari araştırmaya ve yerel belleğe dayanmaktadır. Ziban bölgesindeki bir dizi temsili minareye uygulanan karşılaştırmalı morfolojik analiz, bunları ayırt edebilecek ana kriterin

şaftın konfigürasyonu olduğunu göstermektedir. Böylece minareleri şaftlarının biçimsel özelliklerine göre sınıflandırarak dört morfolojik tip vurgulanmıştır: piramidal minare, prizmatik minare, koni şeklindeki (veya dikilitaş şeklindeki) minare ve melez şekilli (formların kombinasyonu) minare. Buna ek olarak, makale bu minarelerin kronolojik ve bölgesel evrimini ve mimarilerini etkileyen ana faktörleri tartışmaktadır. Mimarın kültürel ve sanatsal katkıları, uzmanlığı ve sosyal aidiyeti, yıkım/yeniden inşa operasyonları ile şekillenen dönemin stili ile birlikte, Ziban'daki eski minarelerin morfolojik çeşitliliğini etkileyen faktörlerdir. Bu araştırma, yerel yapıcı kültür ve Ziban bölgesindeki dini mimariye üslup katkıları hakkında yeni bilgiler getirmektedir. Bu çalışma ile oluşturulan yeni gerçekler, Mağribi yöresel camilerinin ayırt edici morfolojik kimliğini vurgulamakta ve bu tür binalar hakkındaki bilgi durumuyla ilgili boşluğu doldurmaktadır.

MORPHOLOGICAL DIVERSITY OF ANCIENT MINARETS ARCHITECTURE IN THE ZIBAN REGION (ALGERIA): THE QUESTION OF FORM, STYLE AND CHARACTER

The minaret is one of the most powerful symbols of Islam in the world because of its role in the call to prayer (*adhan*). It is undoubtedly a signal of the presence of a mosque in human settlements throughout history. A minaret consists essentially of four main cross-sections (segments): the basement, the shaft (tower), the gallery-balcony (the platform from which the *muezzin* calls out the *adhan*) and the top or lantern. By using these basic components, the master builders combine them ingeniously, so that they generate a wide morphological diversity of minarets that vary according to the region and the period in which they were built. This paper aims to explore and analyse the question of the form, style and character of the architecture of the ancient minarets of the Ziban, a Saharan region in south-eastern Algeria, to understand the origin of this diversity. The methodology adopted is based on a literature review, iconographic documents, an architectural survey and local memory as a means of data collection. The comparative morphological analysis applied to a set of minarets representative of the Ziban region indicates that the main criterion for distinguishing them is the configuration of the shaft. Thus, by classifying the minarets according to the formal attributes of their shafts, four morphological types were identified: the pyramidal minaret, the prismatic minaret, the cone-shaped (or obelisk-shaped) minaret, and the hybrid-shaped (combination of forms) minaret. In addition, the paper discusses the chronological and regional evolution of these minarets as well as the main factors influencing their architecture. The cultural and artistic contributions, the know-how and social affiliation of the builder, along with the style of the period reinforced by the demolition/reconstruction operations, are all factors acting on the morphological diversity of the ancient minarets of the Ziban. This research work brings new knowledge on the vernacular constructive culture and the stylistic contributions to religious architecture in the Ziban region. The new facts established by this study highlight the distinctive morphological identity of *Maghribi* vernacular mosques and fill the gap in the state of knowledge on this type of buildings.

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