

Urban Descriptive Study of the Tamentit Fortress in Adrar**Received date:10/10/2024 Accepted date:17/10/2025 Published date:28/10/2025****Bouharroud Imen ¹**¹ *University of Constantine 2, Algeria,*Email:imene.bouheroud@univ-constantine2.dz**Abstract:**

The desert palaces are among the architectural evidence that distinguishes southern Algeria with its distinctive architectural character. Over time, it formed a very important commercial route known to historians as the route of palaces. The study of this type of architecture is considered a serious topic that has begun to attract the interest of researchers in various sciences (sociology, economics, engineering, archaeology, etc.). Tamentit Fortress is considered one of the most important desert palaces that had a major role in scientific and cultural communication between Islamic cities. It initially gained commercial importance as an important crossing point for caravans that was accompanied by a cultural and scientific movement, as were the scholars who came with trade and were interested in spreading Islam and knowledge in the regions Sahara Desert. The Tuat region has received abundant attention from scholars and jurists until it has become a scientific metropolis that has gained fame in the Islamic regions due to its historical and scientific importance.

Keywords: Desert palaces; Tamentit Fortress; Tuat region; scientific metropolis.

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1. INTRODUCTION

Architecture and architectural art hold a significant place in the history of civilizations, serving as enduring symbols of pride and cultural identity. They provide tangible evidence of the past and offer insights into the values and societal structures of different eras. The desert palaces found in southern North Africa, especially in southern Algeria, stand as remarkable examples of architectural heritage with distinct characteristics.

These desert palaces, forming what historians refer to as the "route of palaces," have not only been important in commercial activities but have also been centers of social, political, and economic transformations over time. They represent the ingenuity and skills of the Saharan people, reflecting their connection to water, security, oases, palm trees, and communities.

Among these desert palaces, the Tamentit Fortress in the Tuat region holds particular significance. It has deep historical roots in the Sahara Desert and has played a crucial role in facilitating scientific and cultural exchanges among Islamic urban centers. Initially serving as a vital hub for trade caravans, it later became a focal point for intellectual and spiritual pursuits, attracting scholars and thinkers who contributed to the spread of Islam and knowledge in the region.

The Tuat region, with its rich historical and scientific heritage, emerged as a prominent center for scholarly activities and served as a sanctuary for intellectuals and ascetics. Its importance transcended mere commercial value, evolving into a hub of learning and cultural exchange that left a lasting impact on the region's development.

The study of these desert palaces has garnered significant attention from researchers across various disciplines, including sociology, economics, engineering, and archaeology. Their exploration not only enriches our understanding of architectural history but also



sheds light on the complex interplay between human societies and their built environments over centuries.

✓ Reasons for choosing this topic:

- Neglect and indifference suffered by most desert palaces, under the pretext that they have lost their function.
- A sense of responsibility towards these heritage treasures to raise awareness.
- Curiosity about the heritage of the southern desert.
- A scarcity of academic research and studies on these architectures and a desire to contribute new insights.

✓ The purpose of this study:

- To explore these desert architectural settlements, learn from past generations' experiences, describe their composition, and understand the methods of the Saharan people's settlement in these ancient populations and their resistance to the region's harshness.

2. Definition of the Palace Linguistically and Terminologically:

2.1 Linguistically

The concept of the word palace, as mentioned in "Lisan al-Arab," refers to "the dwelling, and it is said that every stone house is Quraishian, named so because it restricts (taqsir) within the sanctuary, with its plural being palaces (qusur)."

In the Holy Quran, God says: "*and He makes for you palaces.*" (Al-Furqan, Verse 10) A "mansion" (maqsurah) is a large, fortified house, smaller than a normal house (Ben Sghir Hadri).

Among the general populace, the term palace implies the residence of a caliph or ruler, as well as the dwellings of the elite and wealthy, distinguished by their grandiose construction, thoughtful



planning, and exquisite decoration.

2.2 Terminologically

In the desert, the palace has a different concept, understood through recent studies as a closed common space divided into qualitatively distributed areas, where a human group with the same agricultural interests stores its seasonal crop, and uses it in times of peace for educational, ritualistic, social, and commercial activities, and in times of war for shelter against enemy attacks (Abderrahman, 1988).

In all desert areas, the term "palace" or as specifically called in the local dialect "qṣar" refers to residential groups that sometimes occupy small or large areas, fortified or at least situated on elevated ground, close to valleys and oases. It is a populated settlement divided into neighborhoods specific to each tribe or 'arch', connected by a network of narrow, winding streets that are minimally exposed to sunlight, converging in a public square (rahba), with the palace surrounded by a thick fortified wall (Bamoun).

3. Origin of the Name

Before delving into the historical significance of the Tamentit Fortress, it is essential to explore the origin and meaning of the word "Tamentit." According to the manuscript "Al-Basit fi Akhbar Tamentit" by Baba Haida¹, the name Tamentit is believed to have originated from two foreign words, 'Atman' and 'Tayt,' with 'Atman' signifying the end and 'Tayt' representing the eye in Arabic.

These words were combined, with the 'Alif' at the end of Atman and the beginning of Antit omitted, resulting in the more manageable

¹ Baba Haida: Muhammad Al-Tayyib Ibn Abdul Rahim Al-Tamanrati Al-Touati Al-Qurashi.

form 'Tamentit' which then gained renown. Ibn Khaldun, a reliable source, also mentioned Tamentit in his writings (Mohammed Al-Tayyib, 1977).

Alternatively, the name is thought to have a Berber origin, stemming from the combination of 'Atma' (end) and 'Tayt' (eye), meaning 'the end of the eye.' Some interpretations suggest that 'Atma' and 'Tayt' could be translated as 'eyebrow' and 'eye,' respectively, and that modifications were made to the name for easier pronunciation, leading to 'Tamentit.' (Jaafri)

Another interpretation links 'Aman' (water) and 'Tayt' (eye), giving rise to the name Tamentit, which underscores the significance of water to the fortress's inhabitants. This connection to water is crucial, as it indicates the strategic importance of water sources in the area (Ben Swissi).

The term Tamentit, rooted in Berber culture, carries the meaning of 'eyebrow of the eye,' suggesting that Berbers were among the earliest settlers in the region, followed by various tribes. Ibn Khaldun's frequent references to Tamentit highlight its role as a significant stop in the trade routes between West Africa and the Mali region (Hadji & Kajal).

Historically, ancient Tamentit comprised a series of interconnected forts and palaces, stretching from Nostas Palace in the east to Qasr al-Qubur in the west (Ibn Khaldun, 1983). This layout reflects the fortress's strategic position and its importance in the broader context of regional trade and cultural exchange.

4. Geographical and Astronomical Location

The Tamentit palaces are situated in the southwest region of Algeria, specifically within the Tuat area of Adrar province. Geographically, they are surrounded by the Tadmayt plateau to the northeast, the Sha'ash arc to the west, the Tidikelt plain to the southeast, and the Tanzerouft region to the south. These palaces are



approximately 15 km south of the provincial capital along National Road No. 06, which leads to Reggane (Thiyaga & Fathy).

Administratively, Tamentit shares borders with Adrar municipality to the north, Fenoughil to the south, Ouargla and Tamacine to the east, and Bouda to the west. The municipality of Tamentit is located 1500 km from the Algerian capital and covers an area of 6937 km² (Thiyaga).

Tamentit was constructed on a vast rocky plateau formed by the continuous erosion of sandstone from the Continental Intercalary layer, overlaid with sand and stones. The plateau slopes gradually from east to west toward a depression adjacent to a salt flat. About 35 km west of Tamentit lies Wadi Massoud, while the orchards and palm oases that surround the fortress are situated on its northern slope. Astronomically, Tamentit is positioned at a latitude of 27.46 degrees north and a longitude of 0.16 degrees east (Ben Swissi).

5. History of the Region

Some sources suggest that the initial construction of Tamentit was attributed to the Copts, who introduced the foggara irrigation system to the area, as narrated in Al-Basit's historical account (Jaafri, The City of Tamentit and its Commercial Role in the Sahara).

Alfred Paul John Martin, in his book "Desert Oases," categorized the history of the region into four major phases, based on a vast collection of manuscripts and documents gathered from the fortresses in the early 20th century:

- **Gétule period:** Named after the Gétules, this era spans from prehistoric times to 100 BC, encompassing all the peoples south of the mountains and Wadi Qir.
- **Jewish period:** Extends from 100 BC to 600 AD.
- **Zenata period:** From 600 AD to 1050 AD.

- **Arab period:** From 1050 AD to 1120 AD (Ben Swissi).

6. General Description of Tamentit Fortress

The inhabitants and builders of the Tamentit region, despite lacking formal education in architectural theories, displayed remarkable creativity by utilizing available raw materials and leveraging the expertise of newcomers from diverse backgrounds. This approach resulted in the development of a unique and varied architectural style, showcasing a blend of innovation and aesthetic appeal.

The Tamentit Fortress is characterized by a linear arrangement of fortified villages known as ksars, interconnected by narrow alleys and public squares, all enclosed within high walls and protected by a surrounding trench against external threats.

Historian Sidi Mohamed Ben Baba Haida, who dedicated a separate work to the city of Tamentit, its architecture, and the nature of its structures, described it as a continuous construction of closely linked fortresses surrounded by foundations and gardens irrigated by foggara systems.

He noted the distinct water sources from three directions—east, west, and south—which set it apart from other regions (Mohammed Al-Tayyib, 1977). It is reported to have 366 foggara systems, with some still in operation while others have fallen into disuse. These foggara systems sustain 366 palaces that accommodate guests throughout the year (Interview with the Sheikh of the Bakriya Zawiya.), as depicted in **Figure 1**.



Fig.1. General view of Tamentit Fortress



Source: About the Researcher

7. Types of Forts in the Palace

Among the notable forts within the Tamentit Palace complex are Tahqat Fort, Oulad Ali Ben Moussa Fort, Toufaghi Fort, Oulad Mohamed Fort, Oulad Daoud Fort, Tailout Fort, Oulad Ahmali Fort, and Oulad Ya'qub Fort. Each fort exhibits its unique architectural style, as indicated by foreign studies. An aerial survey conducted by researcher "Echallier" in 1969 and subsequent reconnaissance tours identified a total of 333 forts, categorizing them into six main types based on their architectural characteristics (Echalier, 1972).

8. Palace Landmarks

Generally, these public buildings in their architecture consist of basic components arranged from outside to inside. We classified them according to their functions as follows:

8.1 7.1 Religious Landmarks

8.1.1 The Mosque

The mosque, being the central and most significant structure within the fortress, is oriented towards the qibla, with its pulpit and facade facing this direction. It features a distinctive architectural design characterized by arcades separated by arches. The number of arches varies depending on the length of the arcades, which in turn depends on the mosque's area within the fortress.

A semi-circular niche, approximately 1.5 meters in diameter, is located at the front of the mosque in tYThe qibla wall. Each fort in Tamentit includes a mosque, with the ancient central mosque situated in Tailoulit Fort. Notably, researcher Martin discovered a book dating back to 517 AD within the mihrab of the Oulad Ahmali mosque, suggesting a historical connection possibly to a former Jewish temple site (Echalier, 1972).

A. Exterior Description of the Mosque

The mosque is rectangular in shape, comprising the prayer hall, fortress, and porch roof. It features a relatively small size with the main entrance positioned directly at the fort's entrance, leading to the porch through a 7-meter-long and 1.20-meter-wide corridor. A staircase on the right side leads to the upper courtyard or sahn, a common feature in Saharan religious architecture.

The dimensions of this courtyard are 5.45 meters long and 4.81 meters wide, forming a square shape with varying wall lengths. The prayer hall houses a shallow mihrab measuring 1.90 meters high and 0.70 meters wide.

B. Interior Description of the Mosque

The Oulad Ahmali Mosque showcases typical Saharan architectural elements. Upon entering, a narrow, dim corridor leads to the palm-trunk-covered porch, measuring 2.95 meters by 2.10 meters. Proceeding from the corridor, one reaches the entrance to the rectangular prayer hall, measuring 8.70 meters on the qibla wall and 5.80 meters in length.



The hall features three parallel rows of arches facing the qibla wall, with the first row positioned 1.76 meters from the wall. These arches include semi-circular and rectangular openings, with the mihrab centered on the qibla wall featuring a rectangular recess measuring 0.85 meters wide, 0.50 meters deep, and 1.80 meters high (see Figure 2).

Fig.2. Arcade of Oulad Ahmali Mosque



Source: About the Researcher

8.1.2 The Rahba or Eid Prayer Area

The Rahba serves as an open gathering space within the fortress, primarily used for Eid prayers, sermons, and community events. It lacks permanent structures, except for the semi-circular pulpit facing the qibla. This public square, centrally located within the fortress, acts as a hub for various activities, including seasonal events, festivals, and social gatherings. Children and youth often use it as a playground and meeting point, contributing to social interaction.

Historically, it was a vital area for trade caravans preparing to depart or arriving at the fortress. Today, it remains a vital space for socialization, especially in the absence of dedicated areas, like the Rahba situated between the Bakriya corner on the east side, Oulad Mohamed Fort on the west, and Oulad Ahmali Fort to the north (see

Figure 03).

Fig.3. A side of the Rahba



Source: About the Researcher

8.1.3 The Zawiya

These are centers of religious and cultural radiation, enjoying complete autonomy in following the Qadiriyya, Moussaouiyya, or Tijaniyya paths. Their function is to teach the Quran to boys. Among the most important zawiya in Tamentit Fortress is the Bakriya Zawiya. It includes the zawiya fort, the Sheikh's house, the mosque, the Quranic school, the tomb of Mohammed Bin Bakri, and a manuscript library containing 3600 manuscripts.

The library was divided among family branches, with some parts lost due to neglect and others damaged due to lack of manuscript preservation. All these buildings were rebuilt except for the Sheikh's house, which consists of two rooms, a storage area, and a roof. One enters the first room directly after the house's entrance, serving as the central room and guest reception hall, rectangular in shape, measuring 5.20 meters in length and 3 meters in width, with a semi-circular arch in the middle.

The second room is smaller, used for rest and sleeping, not

exceeding 2.70 meters in length and 2.10 meters in width. The house also contains an internal storage area used for keeping items, with stairs next to the storage door leading to the roof used for sleeping during summer.

8.1.4 The Mausoleums

These are dome-shaped buildings, varying in construction methods and architecture from one area to another, representing one of the most important architectural types built by the people of Tuat in reverence for their deceased scholars and saints.

While these mausoleums vary in design from one region to another within the same province, they generally share a common characteristic of a domed square or circular structure with a small entrance, often adorned with protruding small stones aiding in climbing for maintenance and restoration.

For example, the tomb of Sidi Bayoussef consists of a rectangular base supporting the dome, which measures 3.80 meters in length and 3.45 meters in width from the outside. This dome is surrounded by a brick wall 1.40 meters high, with an entrance on the western side. The main entrance to the Rahba is on the western side, in front of which is a small entrance to the dome containing a single grave for the tomb owner.

These mausoleums are spread around the fortress and in cemeteries, like the tomb of "Sidi El Yazouli" located on the western side of Tamentit Fortress, "Sidi Najem" tomb on the north side, and "Sidi Bayoussef" tomb on the east side, near Diyar Shadhili (See **Figure 04**).

Fig.4. Tomb of Sidi Bayoussef



Source: About the Researcher

8.1.5 The Cemetery

The cemetery consists of adjoining collective graves without a specific architectural design, used by the fortress or fort community for burials. Multiple cemeteries may exist within a single fortress or city. The graves are elevated ground constructions, ranging from ten to twenty centimeters above the ground for ordinary graves and from four to five meters for the tombs of scholars and saints.

The grave construction involves placing two stones of varying lengths, with the larger placed at the deceased's head towards the south and the smaller at the feet towards the north, all oriented from the east-facing qibla (**Figure.5**).

8.2 Civil Landmarks

These are landmarks used collectively, as follows:

8.2.1 Markets



These exist only in major cities like Tamentit and others due to the region's distinctive trade activity, serving as a crucial link between markets in North African cities like Algeria, Tunisia, Morocco, Libya, and southern cities like Kano, Shinqit, Arwan, Agadez, etc.

Al-Ayashi (1090 AH) mentioned in his journey the reason for his extended stay in the region: "Our prolonged stay in this land was due to many pilgrims delaying their gold exchange until reaching Tuat, where gold was cheaper, along with the price of provisions like grain and dates. This town is a hub for caravans coming from Timbuktu and Agadez in the Sudan region, containing many goods and commodities brought from there".

Fig.5. The cemetery adjacent to the Sidi Bayoussef Tomb



Source: About the Researcher

8.2.2 Houses

Entering a house, one finds a spacious guest hall at the center, surrounded by two or three rooms, depending on need and resources. In the old fortress houses, windows were merely openings at the top of the wall for ventilation and light, with a diameter of 25 cm.

Nowadays, residents have cut small windows 40 cm long and 30 cm wide out of wood (**Figure.6 and 7**). Houses have important facilities, each serving a specific purpose:

A. The Storage Area:

Usually beside the house, sometimes at a distance, it is often a square courtyard, partly open and partly covered, surrounded by a mud wall, where annual products like dates, grain, wheat, and various reserves are stored. The Maghili storage (**Figure.8**) has a unique architectural design different from other storages.

Fig.6. Top view of one of the houses



Source: About the Researcher

It is rectangular, 12 meters long and 10.50 meters wide, with an external wall thickness of 1 meter. Inside, the entrance is in the western corner of the northern wall, with a width of 0.80 meters, a height of 1.50 meters, and a foundation depth of 1 meter. The storage wall is 7 meters high, divided into two rooms by a wall with an entrance 0.70 meters wide and 1.40 meters high.

- The first room: 4.50 meters long and 1.50 meters wide, accessed through the main storage entrance.

- The second room: Rectangular, 7.50 meters long and 1.50 meters wide, entered through the doorway in the dividing wall.

The storage also has ventilation holes at the top of the walls and niches in specific wall locations (Al-Kuwa) used for placing lighting tools and other items.

Fig.7. Lighting openings or windows



Source: About the Researcher

B. The latrine:

It is the toilet area, designed considering the wind direction to prevent any discomfort to neighbors. The roof plays a significant role during the summer due to high temperatures, and some houses replace it with an adjacent space called (Al-Housh).

C. The Animal House:

It is a small building on the side of the house consisting of two main areas: one covered and the other uncovered, serving as shelter for domestic animals that the Saharan people rely on for meat, milk, eggs, leather, wool, etc

Fig.8. The large storage of Sheikh Mohammed Ibn Abdel Karim Al-Maghili



Source: About the Researcher

8.2.3 Main Streets

These are large public passages that intersect within the fortress, connecting its main components like the outer gate, mosque, well, etc. These streets are dedicated only to movement and passage, with gatherings allowed only under conditions specified by religious law (**Figure 09**).

8.2.4 Alleys

These are narrow passages and twists linking the houses to the traditional communal main streets. Typically, they are 1.5 to 2 meters wide, with small raised platforms called (Dokkana) at 50 cm high along the walls, used by local craftsmen as spaces to conduct their activities and display their products for sale without obstructing traffic. Along these alleys, some sections are roofed for shade and cooling, while others are open to allow light and sunlight to enter, often extending for 7 meters.

Fig.9. Main Streets

Source: About the Researcher

8.2.5 The Drinking Well

This is reserved for war times when the fortress gate is closed for durations that may vary according to the war conditions. Therefore, it is essential to have a water reserve in the well located at the fortress's center, especially when the Foggara (traditional underground irrigation system) outside the fortress is not accessible.

8.2.6 Drinking and Irrigation Foggara

Consisting of a series of interconnected wells in an ascending order that passes by the fortress and flows into the orchards, following a very precise and remarkable irrigation system. Historically, the region had over two thousand Foggaras, but the number has recently decreased to less than half due to the lowering of water levels and sometimes the drying up of wells. Ibn Khaldun and Al-Ayashi mentioned these in their writings.

Foggara is typically constructed in elevated areas, descending towards lower areas where communities and agricultural zones are established, mostly running from east to west. The construction of a

Foggara, and the associated works to complete it, requires a study of the land to understand its elevation above sea level, the depth of the groundwater, and the precise estimate of its reserve and flow rate.

The process starts by digging the first well from a pre-determined elevated point after confirming water presence, with the well's depth based on the underground water field's depth, sometimes reaching over forty feet. An underground channel is then extended from the first well towards the outlet, connected with ventilation wells dug along the path, spaced between 15 to 30 meters apart (**Figure 10**).

Fig.10. The Irrigation Foggara



Source: About the Researcher

8.2.7 The Tunnel or Underground Shelter

It is a large, wide tunnel that the fortress community collaboratively excavates and engineers, deep and with a thick separating layer from the fortress's foundation. It is used as a refuge for the fortress's inhabitants during summer, providing cool air. The entrance typically has two opposing doors, facilitating air movement and circulation inside (**Figure 11**).

8.3 Defensive Landmarks

These are features created to protect the fortress and defend it from external attacks, described as follows:

Fig.11. The Tunnel or Underground Shelter



Source: About the Researcher

8.3.1 The Perforated Outer Wall

It is very thick, approximately fifty centimeters wide, serving to insulate and break the external heat and sometimes is double-layered. Large stones are placed on its balconies, tied with thick ropes made from palm fibers, used to repel climbing enemies. Some walls have a broad base, one meter thick at the base, rising to a height of 1.60 meters, where the wall thickness begins at 40 centimeters.

8.3.2 Watchtowers

Located at the fortress's four corners, they are pyramid-shaped, broad at the base and narrowing towards the top, with four windows on each side for lighting. They are tall and hollow in the middle, containing stairs and looms for enemy surveillance, with storage below for storing agricultural produce and community property during wars.

Fig.12. Towers and walls of Oulad Mohamed Fort



Source:

About

the

Researcher

8.3.3 The Main Entrance

A very large wooden gate, locally known as the mouth of the fortress, made from palm trunks and iron pieces to hold the trunks together. It is 2.40 meters high, 1.70 meters wide, and 0.50 meters thick. To fix the gate in the wall, two protruding wooden pieces are placed outwardly, forming a horizontal peg that secures in the wall and supports the gate's weight, with a hole at the bottom allowing the gate to rotate.

Examples include the entrance gate of Oulad Mohamed Fort and the gate of Sidi Bayoussef's tomb, with the lock made from locally manufactured iron tools in the shape of a comb's teeth, known as (Afkar).

8.3.4 The Moat Surrounding the Wall



Sometimes filled with water to repel enemies, it is occasionally left dry.

8.3.5 The Bridge

An external passage that crosses the moat to the fortress entrance, made from strong wood and palm trunks tied with thick palm fiber ropes. Typically built in front of fortress gates, the community controls its raising and lowering, setting it up at dawn for entry and exit and raising it after Asr and before Maghrib to guard against enemies.

9. CONCLUSION

The Islamic nation is renowned for its unique architectural style, deeply rooted in the connection between people, land, and the teachings of the Quran. Islamic architecture not only fulfills individual and societal needs but also reflects the responsibility of humans as stewards of the earth. It plays a crucial role in shaping and preserving cultural identity, with Saharan architecture being an integral part of the broader Islamic urban heritage.

However, despite its cultural and historical significance, Tamentit Fortress faces various challenges. Neglect, compounded by natural elements like wind and rain, has contributed to the deterioration of the fortress's structures over time. Additionally, human activities such as the encroachment of concrete and random renovations by residents have led to deviations from the traditional architectural style and materials. These actions have distorted landmarks and disrupted the unified character of the dwellings within the fortress.

Given these challenges, it is essential to take proactive measures to preserve the architectural heritage of Tamentit Fortress. This includes interventions to address neglect, mitigate the impact of

natural factors, and regulate renovations to maintain the authentic character of the buildings.

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