

Understanding the urban form of medinas through walking

Case study of the medina of Bejaia in Algeria

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Abstract:

Understanding and preserving medinas represents a major challenge today, particularly in specific environments like the Maghreb context where this challenge is even more pressing. This context encompasses a significant number of urban fabrics with rich historical and cultural value, often underexplored, represented by medinas rich in diverse spatial configurations. However, most Maghrebi medinas, such as the ancient city of Bejaia in Algeria, continue to degrade over time despite efforts in recent years to preserve their heritage, notably through the implementation of safeguard plans (PPSMVSS). This situation calls for the use of appropriate approaches to grasp the complexities of medina urban fabrics, to valorize them, and to propose suitable solutions. In this regard, walking or strolling represents a crucial tool for perceiving spatial qualities, taking into account all dimensions associated with the morphology of urban fabrics (spatial, cultural, cognitive, landscape, anthropogenic, etc.). In the scope of our research, we explore the Bejaia medina using walking as a tool to capture subtle nuances related to the different environments encountered. Our investigation begins with a multidimensional exploration of the concept of walking in the literature. The study examines the ways in which walking is theorized, perceived, and studied in various fields such as art, philosophy, landscape, archaeology, phenomenology, and geography, with a particular focus on how walking is employed as a method of research and perception. We then explore the Bejaia medina using wandering as an initial step, defined as aimless walking, in order to gain a first contextual understanding. We were primarily guided by our natural curiosity, posing questions that arose as we moved through the different corners of the ancient city. Through morphological study enriched by iconographic analysis, we examine the various historical fabrics of the medina, including pre-colonial fabrics (traces of Kabyle villages, Turkish and Spanish constructions) and colonial fabrics (quarters built during French colonization). This study allowed us to trace specific routes primarily retracing the old paths of inhabitants and crossing various significant spaces of great heritage value within the medina. This sensory experience guided by "smellwalks, soundwalks, lightwalks," etc., allowed us to grasp the spatial and sensory qualities associated with historical environments. Accompanied walks facilitated deep interactions with residents, revealing the identity, cultural, and anthropogenic characteristics related to lived spaces, the medina's heritage, and residents' imaginaries. Our present research illustrates the significant contribution of walking to apprehending morphological and heritage characteristics, demonstrating its crucial importance as a sensitive and holistic approach, revealing the cultural and identity specificities of medinas.

Keywords: Urban form, Perception, Walking, Heritage, Medina of Bejaia

Introduction:

Bejaia, like many other historical cities in Algeria, has been experiencing significant degradation in its architectural heritage in recent times. Many problems have arisen in recent years, such as deterioration in historic structures such as the old city gates, ramparts, ancient buildings, monuments, etc. This is linked not only to the effects of the climate but also to human impact, which is a significant factor due to negligence and lack of awareness, thus leading to a lack of serious efforts for the preservation and restoration of this heritage. Furthermore, some interventions are inappropriate and therefore do not respect the original appearance of the buildings. Faced with this worrying situation, authorities have launched a proactive approach aimed at valorizing this heritage wealth. This is materialized through legislative measures and the establishment of protected areas. However, these laws and regulations are heavily criticized, primarily by the academic sphere, as they do not encompass all dimensions or characteristics related to the urban landscape and the sensitive aspects related to urban fabrics of cities. For example, Algerian Law No. 98-04 on the protection of cultural heritage [1] does not encompass all elements that define the specific qualities of urban spaces contributing to identity and history. Indeed, there is a lack of consideration for perceptual, affective, and multisensory characteristics that represent significant dimensions to understand the tangible value of urban heritage. On the other hand, the legislation defines a landscape perimeter delimited to 200 meters around protected buildings, primarily based on the field of visibility, which means that it only focuses on protecting the immediate aesthetic aspect of buildings, without considering the interaction between buildings and their environment and context [2].

In this context, our present research adopts an approach based on total immersion in the ancient urban fabrics of the medina of Béjaïa, using "walking" as a research method and as a fundamental means for appreciating spatial, sensory, and affective qualities. Our study begins with a detailed morphological analysis of urban spaces aimed at grasping their characteristics and evolution. Alongside this step, an iconographic study using old photographs has helped to understand and reconstruct the urban scene and the various changes in practices within the public space. Subsequently, building on the results of these preliminary analyses, a series of strategic routes have been set and explored through walking, employing a set of qualitative perception techniques such as "Soundwalks" [3], "Smellwalks" [4] [5], and "lightwalks" [6]. These have allowed for the direct perception of sensory characteristics and all hidden elements that cannot be explored through simple analysis of physical characteristics alone. The perceptions of local residents are also gathered through the method of commented tours in order to gain a complete and profound understanding of lived experiences and to grasp the different meanings that pedestrians within the medina attribute to the various places they traverse daily on foot. Through this work, we aim to offer informed perspectives and recommendations for revaluing the historical urban fabrics of the medina of Béjaïa.

1. Walking as a research method:

Walking entails exploring, immersing oneself, and absorbing in an InSitu manner, allowing for reaching depths of analysis that cannot be attained through other methods. Walking enables the perception of sensory and affective qualities related to the spaces traversed. In order to understand all dimensions of urban form, the researcher is supposed to wander and traverse all facets of the terrain; they must smell, observe, touch, hear, or even taste, in order to later "interpret" the elements through the use of their own "sensory perception". The smells and aromas encountered during "walks", the warmth, the cold felt when moving from one place to another, the sounds, the wind, the textures... are elements that allow for establishing a "sensory understanding", for a journey through history by establishing a "bodily relationship" with the site. This can only be established through "walking" [7]. Yannis Hamilakis, an archaeologist and professor at Brown University, speaks of an important concept related to walking: "sensory memory". He criticizes in his book titled "Archaeology and the senses: Human experience, memory, and affect", the "superficial" view attributed to archaeology that does not take into account affective characteristics. He considers that mere physical engagement is very limiting and does not allow for a complete understanding of ancestral heritage.

In a study conducted on "Minoan palaces"¹, the author demonstrates a new way of approaching historical sites based on "bodily engagement through walking", founded on the principle of "multi-temporal and sensory archaeology" [8]. On the other hand, walking represents the best means to experience real situations within societies and to be in direct and close contact with people, in order to understand their culture, way of life, social dynamics, and their impact on spatial structures of environments. British anthropologist Tim Ingold, teaching at the University of Aberdeen and author of several books and scholarly works in this field, is interested in "perception while walking"; he emphasizes that every action in the environment arises from a set of pre-existing elements and cannot be produced in any way disconnected from the world [9]. In his book "Walking with Dragons" translated into French by Pierre Madelin, Ingold states: "*Scientists are not only interested in the final forms of things; they seek to penetrate to the heart of the processes of their formation*" [10]; and according to him, walking represents the best tool to understand the formation and transformation of phenomena [10].

1.1. Participatory walking:

To gather and understand people's perceptions and their interaction with the environment around them, accompanying them represents the best solution; it is in this logic that "participatory walking" is employed by several researchers. Jean-François Auguyard conducted research on the residents of Arlequin in France, aiming to understand their experiences and the relationship between urban spaces and residents' activities. In his book "Step by Step: Everyday Walks in a French Urban Housing Project," Augoyard summarized his experience based on a series of "walks" undertaken along various routes that residents use daily. He concluded that the quality of walking, and the way people move, is not only affected by the built environment or physical and functional elements, but it is influenced by the "psychological," "cultural," and "memorial" characteristics of the residents [11]. On the other hand, Maggie O'Neill and Brian Roberts were interested in a methodology based on "walking interviews," defining it as a biographical method (WIBM). This method involves accompanying walkers "spontaneously," without prior agreement with them on the places to pass through, the time to be spent, or how it will unfold. The chosen route may be modified during the walk, based on the interest generated from the perception of the environment traversed. The book "Walking Methods, Research on the Move," authored by these two authors (Maggie O'Neill and Brian Roberts), addresses this walking method (WIBM) in its broader sense, presenting it in three main parts: theory, experimentation, and the imagination of walking as a new biographical research method [12]. Exploring this book helped us build our research methodology in which we employ accompanied walks as the main method to capture perceptions related to the morphological qualities of the environments traversed in our case study.



Figure 1 - Location of the city of Bejaia in the Mediterranean basin. Map created by the author, using "Datawrapper", 2022.

2. Research methodology and case study:

2.1. Presentation of the case study: The Medina of Bejaia

Bejaia is a key city in the Maghreb region and in Algeria. Positioned in the southern basin of the Mediterranean Sea, it occupies the heart of the North African coast (figure 1). With a distance of 230 kilometers separating it

¹ Minoan palaces are architectural achievements in the form of palaces, such as the Minoan Palaces of Archanes, created by a very ancient civilization dating from 3000 to 1100 BCE, primarily developed in Greece and known as the "Minoan civilization".

from the capital "Algiers," Bejaia holds a strategic position in northern Algeria. The medina of Bejaia, also known as the "old city of Bejaia," represents the historical nucleus of the city.

2.1.1. *Urban evolution of the city of Bejaia:*

Numerous civilizations have marked the history of the medina of Bejaia, beginning with the Phoenicians, followed by the Romans in 33 BCE, and then the Hammadids between 1067 and 1068. This last period was marked by great prosperity and represented a significant turning point in the city's urban structure. Subsequently, from 1509 (or 1510) to 1555, Bejaia was occupied by the Spanish civilization. This phase differed completely from the previous one, as the "military" and "defensive" factors were the main principles in urban planning; thus, this period is characterized by the construction of large fortresses that still exist today. In 1555, the Turkish civilization succeeded, before the arrival of French colonization, which lasted from 1830 until 1962. The latter brought profound restructuring to the city, completely transforming its image by importing the European urban model of that time, with certain formal adaptations to the conditions of the Algerian and Maghreb context.

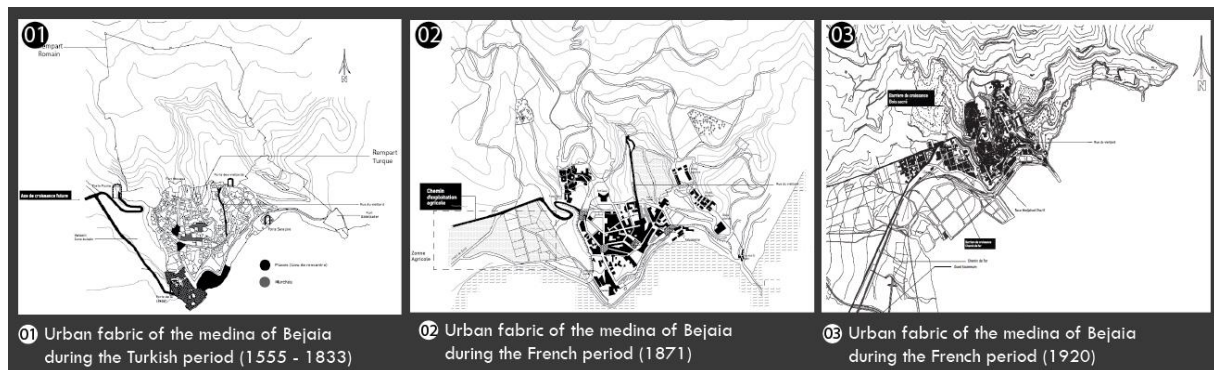


Figure 2 - Urban Evolution of the Medina of Bejaia. Source: created by the author, 2022.

2.2. Research Methodology:

After briefly addressing some fundamental concepts for our research, in this section, we will explain our methodology used to obtain the results. As we explained in the introduction of the article, we relied on various qualitative methods that we combined to meet our objectives.

2.2.1. *Initial stage: Awakening the senses through "Strolling":*

Several researchers throughout history, belonging to various disciplines, have employed "the act of walking" to explore cities in a "spontaneous," "free" manner without pre-set directions or destinations and without pre-tracing pathways or routes to follow. This type of walking is defined by authors and researchers in various ways: strolling, wandering, promenadologie (in French), urban hitchhiking, etc. [13] [14] [15]. In the context of our present research, we therefore appreciated through strolling a number of "spatial qualities" related to the various physical and sensory characteristics encountered; and on the other hand, we interacted with the inhabitants and observed "urban life" with all the activities taking place therein.

2.2.2. *Morphological study of urban fabrics:*

With the aim of grasping the various changes in the spatial structure of the city through different epochs, we first conducted an analysis of the urban evolution of the city of Bejaia, spanning from the Roman occupation to the post-colonial period. This allowed us to trace the different transformations that have shaped the urban landscape of the city. Through this study, we identified the various spaces traversed by pedestrians in the past, providing us with an insight into the routes that have persisted and those that have evolved over the years. Subsequently, an analysis of the current urban form of the city helped understand the organization and layout of public spaces,

buildings, and thoroughfares. This study is complemented by a sitological analysis of the overall landscape of the medina.

2.2.3. *Sitological Analysis:*

To conduct this analysis, we took several photos from different locations in the city of Bejaia, starting from the lower city and moving upwards along the paths most used by pedestrians in the medina and across several levels of proximity. We organized the work into four main frames: primary, secondary, and tertiary [16] [17]; to understand the various features of the landscape that appear as the movement progresses, and then combine them to have both a detailed and comprehensive understanding of the composition of the landscape and the morphology of the city.

2.2.4. *Iconographic Study:*

Two methods of content analysis are adopted. Firstly, we use the "denotative code" method, which primarily allows reading the visual and physical aspects of the photos and all the components that can be denoted [18] [19], and the second method called the "Connotative Method" enables reading the symbolic aspect and the meanings conveyed by the photo beyond what is visually observed [20]. These two methods allow for both descriptive and interpretative work and provide a significant amount of information on the perceptual and affective characteristics associated with the different environments studied in the medina of Bejaia.



Figure 3 - Some selected photos for the study. Image sources : Bejaia à travers ses anciennes photos (Fb)

2.2.5. *The walking journal as a tool for sensory perception:*

This tool served us for dual purposes: firstly, as researchers, we used the walking journal to record all our impressions, sensations, and emotional and affective responses to the various perceived qualities in the spaces traversed in the form of text, drawings, taking photos, and even sound recordings. For each route, we carried out the same work, thus creating a specific walking journal for each, which corresponds to the traversed route. In addition to our own subjective experience, participants noted their sensations and perceptions throughout the routes and at selected locations. They thus compiled several walking journals during the accompanied walks.

2.2.6. *Accompanied walks as a tool for understanding the perceptions of walkers and inhabitants:*

We opted for a diversified sample that includes various categories of people, different genders, ages, and professions. Some individuals were directly invited to participate in this research, mainly former residents of the medina, while others were encountered directly on-site, and the remainder were suggested by the initial participants (snowball sampling). In total, we gathered 26 volunteers who consented to explore the city on foot with us.

2.2.7. *Selection of walking routes:*

The previous steps allowed us to determine the most important routes in the medina, which are the most frequented by walkers and pass



Figure 4 - The map of the selected routes in the Medina of Bejaia. Source: created by the author. 2023

through spaces that have significant potential due to their historical, cultural, social, and identity importance. On the other hand, some spaces classified as abandoned or marginalized have been recognized for their importance in the old city; it is about determining how they could be revalued and requalified to benefit from their potential and reintegrate them into urban fabrics. The intrinsic qualities of the different selected routes were identified by traversing them on foot and using what is called the walking journal. Each selected route underwent a detailed description, initially determining the various physical aspects such as overall configuration, slope, width, typologies, accessibility, materials, etc. The aim is to understand how the various architectural details affect the perception and sense of belonging among residents and how they influence walking practice within the medina. Subsequently, the sensory and sensitive experience through the different selected routes allows for noting the different sensations, emotions, and affections, using techniques such as soundwalks, smellwalks, and lightwalks.

3. Research results:

In this article, we will only present the study conducted on a single neighborhood of the medina (the Bab El Louz neighborhood), illustrating the approach followed for other neighborhoods of the city.

3.1. Location of the Bab El Louz neighborhood:

The Bab El Louz neighborhood is located in the upper part on the west side of the medina of Bejaia. It is accessible through the Fouka gate and via Fatima Street, which starts from the central square of the urban fabric of the city (Arcenal square).

3.2. Study of the physical and spatial character:

The urban fabric of the Bab El Louz neighborhood is mainly pre-colonial and consists of traditional houses, most of which are built in the "Kabyle style," interconnected by a network of walking paths that facilitate internal circulation and connect this neighborhood to the lower part of the city.

The Bab El Louz neighborhood is the oldest in the medina of Bejaia and one of the neighborhoods that has retained many traces of its morphology after the period of French colonization. This neighborhood consists of two main parts, as it developed in two distinct periods. The first part is encountered when ascending from the lower city of Bejaia, passing through the Sidi Soufi mosque until reaching the Sidi El Khider mosque. It is therefore the oldest area of the neighborhood and represents its historical nucleus. The second part represents the northern area of the neighborhood, which begins from Lemerancier Street and is gradually built as an extension of the ancient urban fabric and the extension of pathways from the lower part.



Figure 5 - Location of the Bab El Louz Neighborhood
Source: Bing Maps satellite images

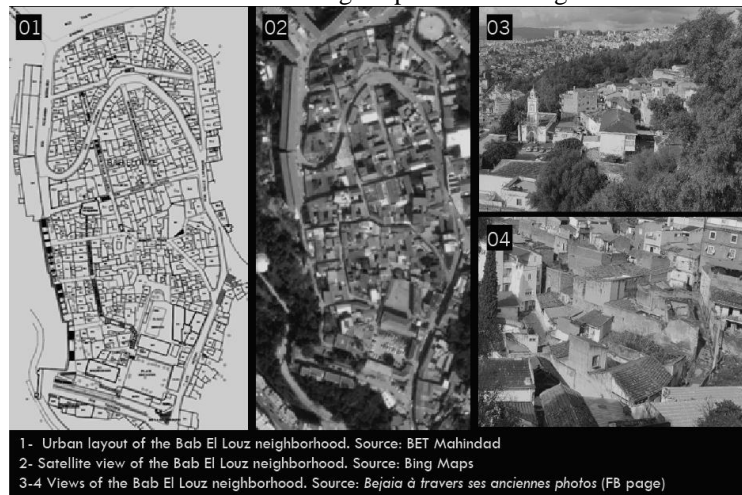


Figure 6 - Views of the Bab El Louz neighborhood. Source: created by the author. 2022



Figure 7 - Plan illustrating the two parts of the Bab El Louz neighborhood. Source: created by the author. 2022

The transects and sections we conducted in the Bab El Louz neighborhood demonstrate how the houses in the neighborhood are situated on the site. It is observed that the houses are built in terraces to conform to the slope and adapt to the topography, allowing for good integration into the rugged terrain. The study of house plans has shown that the majority of them follow a courtyard model, typically surrounded by three or four rooms. The dimensions of the courtyards vary from one house to another depending on the size of the plot on which the dwelling is built. The different variations in the size and layout of the courtyards demonstrate the adaptability of this traditional architectural model to the topographical constraints of the site, thus meeting the needs of the residents. Generally, the houses in the neighborhood are partially embedded to preserve privacy, preventing visibility of the interior rooms from the outside. On the other hand, a vestibule typically separates the main entrance from the central courtyard of the houses, always creating a gradient of intimacy between the public and private space. Many houses have windows that are oriented towards the interior (the courtyard), with small openings to the outside. As for the roofs, they vary from one house to another, but most have a dry tile roof. In most cases, the facades of houses are characterized by simplicity and lack any external decoration.

Among the selected routes presented in the "Research Methodology" section, there are two that pass through the urban fabric of the Bab El Louz neighborhood. In this article, we will present the results for a single route, referred to as AVP1.

3.3. Description of the route:

This route starts from the lower city, specifically in the Lakhmis neighborhood, then ascends towards the ancient city gate built during the Hammadid period, called the Fouka gate (02), while passing through Boulevard Amirouche (01). The walk continues by ascending the staircase known as the "rampart staircase," located on the periphery of the neighborhood, passing between the houses on one side and the Hammadid rampart on the other side. The route ends in the residential area called "El Batima," marking the end of the Bab El Louz neighborhood. As explained in the research methodology, we divided the route into a series of sections to simplify and facilitate analysis.

3.3.1. Olfactory Experience:

The information gathered through our own olfactory experience documented during the "smellwalks," using the walk journals as well as those from the participants, has been classified into tables for systematic analysis (figure 10). The table contains a set of columns, presenting the following elements: qualitative description of the odor, intensity of the odor (strong, weak...), duration of odor persistence, the date of the memory the odor recalls (childhood...), the occasion of the memory (a family event...), and finally a column containing the result of perception, i.e.,

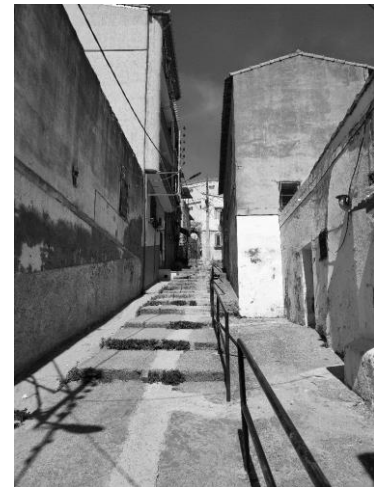


Figure 8 - Urban staircase within the Bab El Louz neighborhood. Source: Photo taken by the author, 2023.

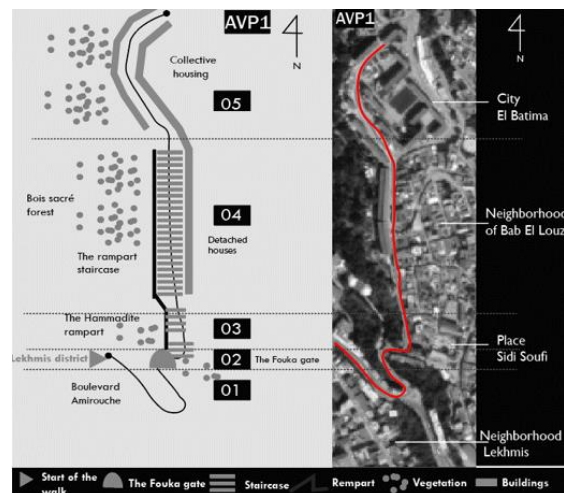


Figure 9 - Route AVP 1. Source: created by the author. 2023

Small Walk Perception subjective	Séjour		Marché		Djebel		Date du souvenir		Occasion lieu du souvenir		Perception
	Qualitatif	Quantitatif	Qualitatif	Quantitatif	Qualitatif	Quantitatif	Qualitatif	Quantitatif	Qualitatif	Quantitatif	
01	Bois sacré	Fort	Moyenne	Fort	Parasitaire	Fort	Enfance	1980	Enfance	1980	Enfance
02	Bois sacré	Fort	Moyenne	Fort	Parasitaire	Fort	Enfance	1980	Enfance	1980	Enfance
03	Bois sacré	Fort	Moyenne	Fort	Parasitaire	Fort	Enfance	1980	Enfance	1980	Enfance
04	Bois sacré	Fort	Moyenne	Fort	Parasitaire	Fort	Enfance	1980	Enfance	1980	Enfance
05	Bois sacré	Fort	Moyenne	Fort	Parasitaire	Fort	Enfance	1980	Enfance	1980	Enfance

Figure 10 - Diagram gathering the information collected during the smellwalks along the AVP1 route. Source: created by the author. 2023

a description of the sensations and feelings provoked by the odor (nostalgia, joy...). Subsequently, the information classified in the table is graphically represented as shown in Figure 11. Colors represent different odors. The darker the color, the stronger the odor. Circles indicate the persistence of the odor; the larger the circle, the more persistent the odors in that area. Feelings are also represented in text form.

Throughout the journey, the perceptions of the inhabitants change from one sequence to another, and the olfactory experience varies throughout the day and across seasons, reflecting the rhythms of urban life. We have observed a rich and diverse sensory richness associated with smells within the Medina of Bejaia. These odors are often linked to memories and emotions among the city's inhabitants, fostering a sense of belonging to their city. Residents are also attached to specific smells within the Medina (emotional connection). Different feelings such as nostalgia and spirituality develop. On the other hand, we have observed that smells affect the perception of visitors to the city, stimulating their curiosity and contributing to the appreciation of the Medina's heritage. This provides visitors with an authentic sensory experience, encouraging them to explore the various corners of the Medina more thoroughly. This olfactory experience is an integral part of the heritage of the Medina of Bejaia, contributing to the understanding of its cultural and identity characteristics. Smells therefore represent living witnesses of the city's history and culture. Taking this sensory dimension into account helps to enhance the city's heritage by reinforcing its authenticity, and on the other hand, this helps to enhance the city's tourist attractiveness.

Conclusion:

The heritage of the Medina of Bejaia is rich in both physical and sensory qualities. However, the preservation plan in place does not seem sufficiently inclusive to fully integrate these crucial sensory aspects. Indeed, this plan focuses primarily on physical and aesthetic aspects, without considering other essential aspects for the valorization and preservation of the heritage. It is concerning to note that in the context of ongoing restoration operations, which concern certain important buildings in the Medina, perceptual aspects are often ignored, as these interventions typically limit themselves to repairing visible aspects and apparent elements. The exclusion of sensitive and sensory characteristics leads to a "depersonalization" of space and dissociates it from collective memory, leaving room for superficial and shallow aesthetic restoration. Furthermore, the participation of the local population in the process of preservation and valorization of the heritage is indispensable because inhabitants of the areas are sensitive to sensory characteristics; this helps reinforce residents' sense of responsibility towards their heritage and aids in collective awareness.

On the other hand, to gain a comprehensive understanding of the urban form of the Medina and its heritage, morphological study represents an essential tool. However, it is important to adopt a broader approach with total immersion in the studied fabrics, using In situ methods, allowing for a direct connection with the studied environment. The researcher must thus fully "immerse" themselves in the urban space, interact with its characteristics to perceive its qualities, and be interested in all the subtleties encountered in the traversed

SmellWalk AVPI

Boulevard Aïrouche (Début du parcours)
Terre humide après la pluie
Arbre coudé
Cajouilles grillées
Parfums de café des kiosques
Fleurs fraîches des arbres
Odeur de sapin des kiosques
Approche de la Porte Fouka
Pierres anciennes légèrement humides
Eau courante
Porte Fouka
Plantes grimpantes sur la pierre
Derrière la Mosquée de Sidi Soufi :
Cajoux sautés
Escalier du rempart
Odeur de friture de tortue
Entre rempart et maisons kabyles :
Odeur de plats traditionnellement cuisinés
Cajoux traditionnellement fraîchement cuits
Bouillottes traditionnelles et bouillottes
El Batisma (Fin de parcours)
Odeur de béton frais des grands ensembles
Cair et échantillons des vêtements suspendus
Mélange des balcons et grilles
Pouspière des rampes
Gaz d'échappement
Odeur de graisse de garage

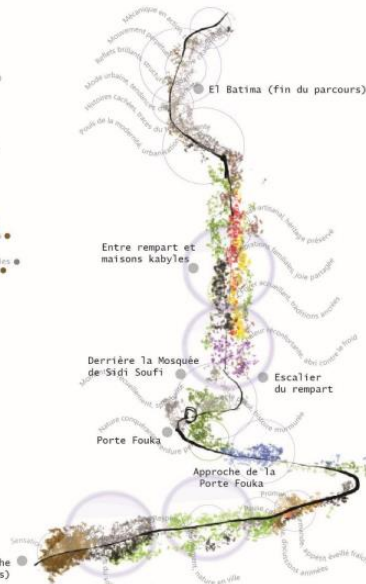


Figure 11 : Graphic representation of the information collected during the smellwalks along the AVPI route. Source: created by the author. 2023

environments. Additionally, they must observe people in the studied environment, observe them from a distance, to try to decipher their ways of acting and interacting with the different experiences offered by the city: gazes, gestures, contact established with others, but also interact with them to grasp certain unexpressed elements, seize emotions and affections, while always considering temporality, varying study times. In this sense, walking emerges as a very important research method, allowing for bodily engagement through multisensory immersion within urban space.

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