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Original Research Article

A Comparative Study of the Quality of Construction and Decoration of Wooden Mihrabs in the Islamic World

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Abstract

Introduction: From the early Islamic centuries, the mihrab gradually became an essential and indispensable element of mosques. The mihrab is a recess on the qibla side, constructed with various materials, and has been a focus of poets in describing the highest levels of mysticism. Wood is one of the rarest materials Islamic architects used to construct mihrabs. Studies show that 12 wooden mihrabs have been identified across the Islamic world. Through comparison and technical analysis of the quality of wooden mihrab construction, this paper seeks to answer this question: «How have the distinctions and similarities of wooden mihrabs in terms of decoration, overall form, and construction and decoration techniques been?»

Research Method: The research takes a fundamental and qualitative approach, with the data examined through a descriptive-comparative method. The purposeful selection of samples was based on wooden materials. The time frame of the research spans from the 4th to the 10th century A.H.

Findings: A noteworthy point regarding wooden mihrabs is their construction date or period, which spans continuously from the 5th to the 8th centuries A.H. Technically, two main construction approaches can be identified. In the first type, decorations and motifs are carved directly on the frames, in addition to the spaces between the frames, and the frame is not hidden from the viewer's eye. In the second type, the main frame is hidden behind separate decorative pieces and panels that form the decorative and visual structure of the mihrab. In their decoration, calligraphic and geometric motifs are also dominant over plant motifs.

Conclusion: As mihrabs move further away from the geographical core of Islamic lands, larger portions of their surfaces are occupied by Quranic inscriptions, which serve as the most tangible element of the representation of Islam. In regions like Egypt or Syria, which were among the first lands conquered by Muslims, in addition to the increasing abstraction of motifs, Quranic verses play a lesser role in the overall decoration of the mihrab compared to plant and geometric patterns. Another evidence for this claim is the walls covered with Quranic verses in the Great Mosque of Xi'an, China, and the exclusive use of Surah Al-Fath for the mihrabs of mosques in China.

Keywords

Mosque Mihrab, Wooden Mihrab, Mihrab Carving, Wood Fretwork, Wood Carving

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Introduction and Problem Definition

As the marker of prayer direction for Muslims, the mihrab occupies the center of the mosque's Qibla wall to show Mecca's direction. They are gradually becoming inseparable parts of mosques in Islamic countries. While durable masonry materials like stone and brick were seemingly of choice, mihrab builders have utilized an unprecedented variety of other materials, including wood. The exact number of wooden mihrabs ever built will continue to elude us, given such factors as the biological properties of wood, conflagrations, etc. The mihrab's historical origin has long been controversial, with some crediting it to pre-Iranian rituals like Mithraism and others looking for an Arabic provenance. Whatever the right answer, it became an integral part of mosque architecture across the Islamic world. Probably, the shape, decoration, embellishments, and construction materials would accrue indigenous flavors in different cultural and political milieus. While locally available materials in mosque construction were the most favored, probably more resilient materials were frequently used for the core structure. In particular, one may refer to the use of wood in forming main structural elements (such as columns and ceiling) and ancillary ornaments (doors, windows, minbar). Put another way, the application of and the properties expected from this natural organic material were twofold: when used for columns, a lighter and earthquake-resistant structure was intended; when used for ancillary decorations, its workability and natural visual appeal were at stake. Thus, the use of wood for the structure of mihrabs was often related to its aesthetic functions and properties in architecture. In the Muslim world, there are a series of surviving historic wooden mihrabs ranging from the 10th to the 16th centuries A.D. These instances are scattered over a vast region extending from China to Egypt. Due to this broad distribution, the term Islamic world was used in the paper's title to denote this cultural geography of the Muslims. The main question the present paper seeks to answer is: What were the similarities and dissimilarities of the wooden mihrabs in embellishments, general shape, and the construction and decoration techniques? To this end, first, the known historical mihrabs from the relevant temporal and spatial scopes will be catalogued. A description and compassion of the pertinent cases will follow, regarding general shape, embellishments, and construction and decoration techniques. The observed commonalities and discrepancies will then be visually presented in tabular form. Lastly, the outcome of the comparisons will be analyzed and discussed.

Research Method

Fundamental in nature and qualitative in approach, this study uses a descriptive-comparative method to examine the dataset collected from online and library sources. The central criterion underpinning the selective sampling of the specimens is the wooden material. The covered period spans the 10th to the 16th centuries A.D. Thus, the wooden mihrabs at the following mosques/tombs form the study sample: Abyaneh (Kashan, Iran), Iskodar (Tajikistan), Al-Sayyida Ruqayya, Al-Sayyida Nafisa, and al-Azhar (Egypt), Al-Halawiyya and Maqam Ibrahim within the Citadel of Aleppo (Syria), Daxuexi and the Great Mosque of Xi'an (China), Taşkın Pasha at the village of Damsa (Turkey), Shah Rukn-i-'Alam in Multan (Pakistan), and Shah Mohiuddin in Charkh province (Afghanistan). These mihrabs were chronicled via inquiries into the library and online sources. Obviously, there may be additional examples in other parts of the Muslim world that still await publication and publicizing, hence not having been accessible to the authors. Note that the results of the present work are not intended to be generalized to such potential examples. Also, the lack of physical access to the entire sample and the absence of laboratory analyses (barring the

passing references to a few cases in systematic studies) made it impossible in most cases to identify the woods to the genus/species level.

Research Background

So far, scattered studies have been conducted on wooden mihrabs in Islamic countries, the most important of which are as follows. «Al-Sulaiti» (2010) conducted extensive research in his master's thesis entitled «Woodworking in Egypt: Style, Influences, and Its Development during the Fatimid Era», aiming to explore the connection and evolution of historical wooden artifacts of the Fatimids in Egypt. He noted the three wooden mihrabs of Sayyida Ruqayya, Sayyida Nafisa, and Al-Azhar in Cairo, attributing the quality of the existing works to the cultural, political, and social elements of the Fatimid rulers. In the paper «The Unique Wooden Mihrab of the Iskodar Mosque in Tajikistan», «Faqih Mirzaei» (2002) introduced and briefly examined the mihrab's physical characteristics, including its decorations and epigraphic evidence. He concludes that this mihrab is worthy of recognition as a significant wooden artifact in Tajikistan. In the article «Woodwork in Syria, Palestine, and Egypt during the 12th and 13th Centuries», «Bloom» (2009) aimed to study and examine the wooden artifacts of these countries, focusing on the construction and decoration techniques of wooden mihrabs from the 12th and 13th centuries. This research showed that the decoration techniques of Syria often influenced the wooden artifacts of Egypt. In the article entitled «Wooden Mihrab of Taşkın Pasha Mosque in Damsa Village of Ürgüp», «Bakirer» (1971) presented a detailed account of its dimensions, inscriptions, and carved decorations as well as a brief pictorial comparison with the three wooden mihrabs of Egypt and also the one from Tajikistan. Accordingly, all the research conducted so far has only examined and studied one or more wooden mihrabs separately, and no research has compared them to identify and align construction and decoration techniques.

Mihrab

The term «mihrab» was established in the Arabic language before Islam and was always associated with the concepts of height, elevation, and nobility in Arabic poetry; however, it has been used with different meanings and applications after Islam. The Quranic dictionary places the term mihrab under the general entry «harb» (war), because the believers rise to fight against Satan and unruly desires at a mihrab (Gharib, 1987). Apparently, there was no mihrab at the primordial mosques; instead, the entire Qibla wall most plausibly fulfilled its function. The Umayyad caliph al-Walid I perhaps installed the first surviving mihrab at Al-Nabi Mosque in Medina in 706 A.D. Apart from being a directional marker, it is believed that the first mihrabs had a ceremonial or ritual role associated with royal symbolism. Exquisite mihrabs would later come to the fore, among them being those of Iran and Egypt. Iranian mihrabs are particularly conspicuous and opulent in both architecture (precise mathematical and geometric proportions, and use of various types of arches and friezes) and function (an assortment of inscriptions and decorative patterns), and even in most cases their sumptuously rich adornments outshine the architectural design (Shapourian et al., 2021).

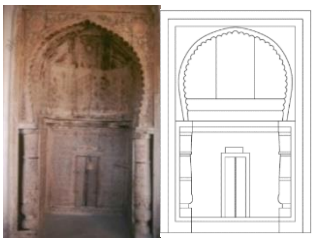
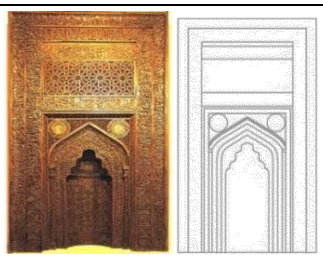
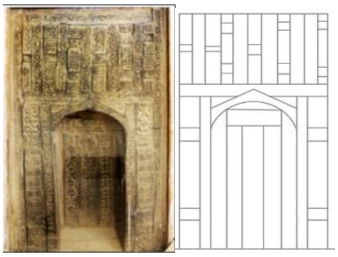
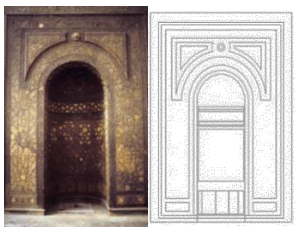
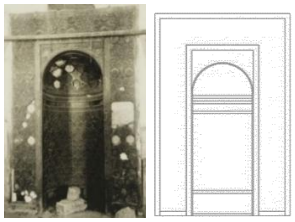
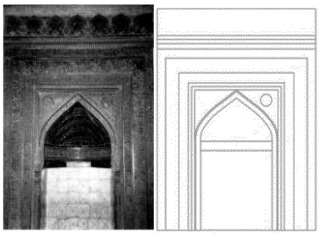
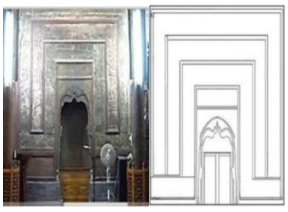
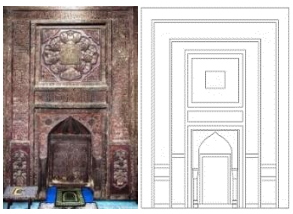
Studied Wooden Mihrabs

1. Jameh Mosque, Abyaneh Village, Isfahan, Iran: The mihrab is embedded in the wall on the lower level of the mosque. A dated inscription relates its construction to 477 A.H./1084 A.D. The dimensions of the mihrab are 207 cm in height and 120 cm in width, with a border and a 14 cm arch. The entire surface of the mihrab is covered with separate rectangular frames of varying sizes, placed vertically next to each other. All the motifs, including geometric and floral designs as well as inscriptions, are carved within these frames. The inscriptions are all in Kufic and contain Ayat al-Kursi (verse 255 of surah al-Baqara), verse 18 of surah al-Al Imran, and al-Asmaʾ al-Husna.

2. Shah Mohiuddin Mosque, Afghanistan: Located in Charkh District of Logar Province, the mosque hosts one of the earliest wooden mihrabs in the Islamic world. The Kufic inscriptions adorning the mihrab trace its construction back to the Ghaznavid period. Some sources attribute it to the reign of the Ghaznavid Mas'ud III (508–492 A.H./1099–1115 A.D.) (Bloom & Blair, 2009, 99). Judging by its great horseshoe arch, the mihrab seems to also surpass most of its counterparts in dimensions, and reportedly measures 2.9 m high, 1.4 m wide (Mahmoud, 2017), and about 1 m deep. Decorations consist of floral designs and geometric patterns, with miniature inscriptions sometimes placed within the latter. A feature unique to this mihrab is the centrally positioned double door of about 1 m high that gives access to a small cell beyond. The lower curves of the "archivolt" are formed of denticulated planks. The thick pilasters flanking the arch were meant to be structural, not just ornamental. A closer look at the available pictures proved some of the inscriptions to be parts of the Quranic surahs of Fatiha-ul-Kitab and Ikhlas, as well as Ayat-ul-Kursi, all carved in Kufic script. These epigraphic materials still await detailed documentation; only a series of preliminary studies are available.

3. Taşkın Pasha Mosque, Ankara: No precise date is inscribed on the mihrab. However, since the tombs found in its courtyard bear inscriptions dating back to the 8th century AH, this mihrab, measuring 350 cm in length, 203 cm in width, and 65 cm in depth, is made of walnut wood (Bakirer, 1971), and thus ranks among the largest known examples from Islamic mosques. The lobed intrados of the horseshoe arch is very reminiscent of the Islamic architecture of Spain and Morocco, and the overlying «blind arches» formed by wooden planks are ogival. The pediment contains a large panel with an interlace of geometric (12-pointed stars) and floral motifs. However, in other areas, only small floral motifs appear in separate panels. An idiosyncratic attribute of this mihrab is the Quranic inscriptions in Thuluth bedecking almost half of its entire surface. The outermost band is Ayat al-Kursi, while the middle one displays the closing verses, 20 to 24, of Surah al-Hashr. Apart from Bakirer's partial decipherment that encompassed verses 21 to 23, there also occur the two words «محمد» and «الله» at the center of the two big circles occupying the corners, and verses 22 and 23 of the same surah in the outer fringes of the same circles. Bakirer's account has failed to notice these latter details (Bakirer, 1971). Verse 31 of surah al-Ahqaf appears in the uppermost horizontal inscription band. The underlying horizontal band bears the Tashahhud of the prayer, while verse 18 of Surah al-Towbah on the building and repairing mosques adorns the area above the ogive arch. Finally, Surah al-Tawhid is caved horizontally within the semi-circular niche of the mihrab (Table 1).

Table 1. Wooden mihrabs from the 11th to 14th centuries A.D. Source: Authors.

Picture		
 Shah Mohiuddin Mosque, Afghanistan. Source: Bloom & Blair, 2009, 517.	 Taşkın Pasha Mosque. Source: Bakirer, 1971.	 Jameh Mosque, Abyaneh Village, Isfahan.
 Al-Halawiyya Madrasa. Source: El Barbary et al., 2017.	 Maqam Ibrahim in Syria. Source: Meinicke, 1992.	 Tomb of Shah Rukn-i-'Alam. Source: Khan, 1977.
 Daxuexi Alley Mosque. Source: Hagras, 2019.	 Mausoleum of Sayyida Nafisa . Source: Bakirer, 1971.	 The Great Mosque of Xi'an (Xi'an Huahuexiang Mosque). Source: Dilmi, 2014.
 Mihrab presented by al-Āmir bi-Aḥkām Allāh. Source: Bakirer, 1971.	 Iskodar Mosque. Source: Faqih Mirzaei, 2002.	 Mausoleum of Sayyida Ruqayya. Source: Bakirer, 1971.

4. Tomb of Shah Rukn-i-'Alam, Pakistan: The Multan region of Punjab, where the tomb of the Sufi saint Shah Rukn-i-'Alam lies, maintained close ties with Afghanistan and eastern Iran. The tomb was commissioned by Ghiyath al-Din Tughluq, aka Ghazi Malik, in 720–724 A.H./1337–1341 A.D. on a hill dominating the city (Nazari & Bolkhari, 2015). Measuring 3.4 m high and 2.6 m wide, the tomb's mihrab sits within the wall. In light of the available old photos, the historical mihrab has seemingly undergone major restoration work in recent decades, as part of which its perished lower parts were apparently covered with tileworks which appear to be later additions to the otherwise wooden original structure. The ogival arch is hemmed in by floral motifs. The niche is covered in geometric motifs, while the remaining parts exhibit carved floral patterns. From the existing photos, it was possible to read the sole existing inscription, Ayat al-Kursi, carved in Thuluth around the edge of the arch.

5. Al-Halawiyya Madrasa, Syria: According to the inscription on the frame, the date of construction of the mosque's wooden mihrab is 643 A.H. (1245) (Abd al-Razik & Abd al-Khalik, 2019). The mihrab represents a masterpiece of woodcarving and calligraphy. Made of pine wood, it measures ca. 4.5 m high and 3.5 m wide. The mainly geometric patterns are skillfully entwined with lines and floral motifs. An analogous mihrab that once purportedly lay at the Nur al-Din Mosque within the Aleppo Citadel was destroyed or removed during the French rule (Takieddine & Abd al-Ghafour, 2023). Above the niche, there is a pair of spandrels that project from the main structure. Resembling right triangles with curved hypotenuses, these symmetric forms are filled with geometric designs like multi-pointed stars. They are also girdled by thick bands bearing verses 36 to 38 of the surah al-Nur in Naskh. Apart from these previously known epigraphs, closer analysis showed that the one on the lower leg of the left triangle, when viewed from the front, represents the opening of verse 18 of Surah al-Tawbah. Other Quranic inscriptions from the surah Al-Wakeh in Kufic occur on the intrados. The outermost epigraph consists of the names of the mihrab's patrons.

6. Maqam Ibrahim in Syria: The now vanished exquisite wooden mihrab of the building is known today only from two photos from the mid-20th century. (Herzfeld, 1954) dates the wooden and marble works at this building to the reign of Nur al-Din. Yet, M. (Meinicke, 1992) suggests that the mosque's restoration probably took place in the last decade of the 13th century A.D. following the damages the castle suffered from the Mongol raids against Aleppo in 658–659 A.H./1275–1276 A.D. He concludes that the wooden mihrab might be related to this restoration phase. The available pictures show that the mihrab contains at least three Kufic inscription bands, which are illegible in the published low-quality images. The entire mihrab is crammed with geometric patterns in fretwork. Atop the fully semi-circular central arch is a monolith frame of carved Arabesque motifs, perhaps a later addition, as the motifs are at odds with those of the other parts of the mihrab (Table 2).

Table 2. Information about Wooden Mihrabs in the Islamic World. Source: Authors.

No.	Building	Region	Building type	Construction date		Current location	Dimensions (m)	
				A.H.	A.D.		Length	Width
1	Jami of Abyaneh	Iran	Mosque	5th	11th	Original place	2.07	1.2
2	Shah Mohiuddin Mosque	Afghanistan	Mosque	5th	11th	Original place	2.9	1.4
3	Taşkın Pasha Mosque, Damsa	Turkey	Mosque	8th	14th	Ethnography Museum of Ankara	3.5	2.03
4	Shah Rukn-i-'Alam	Pakistan	Mausoleum	8th	14th	Original place	3.4	2.6
5	Al-Halawiyya Madrasa	Syria	Mosque/Madrasa	7th	13th	Original place	4.5	3.5
6	Maqam Ibrahim in Salihin	Syria	Mosque	7th	13th	Destroyed	Unspecified	Unspecified
7	Great Mosque of Xi'an	China	Mosque	8th	14th	Original place	3.9	5.04
8	Daxuexi Alley Mosque	China	Mosque	8th	14th	Original place	2	0.8
9	Sayyida Nafisa	Egypt	Mosque/Madrasa	6th	12th	Museum of Islamic Art, Cairo	1.92	0.88
10	Sayyida Ruqayya	Egypt	Mosque/Madrasa	6th	12th	Museum of Islamic Art, Cairo	2.1	1.11
11	Al-Azhar	Egypt	Mosque	6th	12th	Museum of Islamic Art, Cairo	1.65	1.19
12	Iskodar	Tajikistan	Mosque	6th	12th	National Museum of Tajikistan	2.9	1.8

7. The Great Mosque of Xi'an (Xi'an Huahuexiang Mosque), China: Xi'an was the first Chinese city to encounter Islam (Tellier, 2009). The mihrab is 5 m high and 4 m wide, exhibiting two broad inscription bands on the sides. The entire surface (even the elements and letters forming the inscriptions) is jam-packed with minuscule floral motifs. Larger patterns are reserved simply for the pediment. Floral designs also frame panels with the names of Allah. The central ogee-arched niche flanked by short pilasters on both sides is likewise covered with such patterns. Verses 1 to 4 of Surah al-Fath appear on the fringe of the outermost panel on both the right and left sides. Also, scrutiny of the photos revealed verses 18 and 19 of Surah al-Tawba on the inner frieze. The previous reports have overlooked these verses, all carved in Tuluth. Also, the Kufic epigraph « لا اله الا الله محمد رسول

الله» occupies part of the pediment, on all four sides of which occur several others like « ملک الله». In the mihrab's visual focal point, lotuses rise out of water waves, interspersed with the Surah al-Tawhid.

8. Daxuexi Alley Mosque, China: This mosque is located near the Great Mosque of Xi'an. Based on the existing inscriptions, this wooden mihrab dates back to the reign of Emperor Jiajing of the Ming Dynasty in 1523 A.D. (Hagras, 2019). The mosque has three halls, and the huge wooden mihrab lies in the third hall, Houyaodian, the most prominent and earliest part of the interior mosque. The mihrab has a rectangular recess with a pointed arch. The approximate dimensions of the mihrab are 260 cm in width, 50 cm in depth, and 400 cm in height. The ubiquitous ornaments covering almost the entire surface of the mihrab seem to consist of Quranic verses. «Hagras» (2019) interprets the calligraphic band girdling the mihrab as verses 1 to 7 of Surah al-Fath in Thuluth and the one in the central frieze as Ayat al-Kursi in Kufic. However, by careful analysis of the photos, the inner frieze was found to be the continuation of the beginning verses of Surah al-Fath up to the end of verse 10.

9. Mausoleum of Sayyida Ruqayya, Egypt: The dating of the mihrab hinges on an inscription in its upper facade, which clearly states it was built for the tomb of Sayyida Ruqayya in 527 A.H./1133 A.D. (Khalifa Hammad, 2023). There are reportedly three additional mihrabs in different materials within the building (Yeomans, 2006, 152). The mihrab's facade is rectangular and features a rectangular opening in the center, topped with a pointed arch. Following some restorations, it is currently on display at the Museum of Islamic Art in Cairo. The mihrab is 2.1 m high, 1.11 m wide, and 0.45 m deep. It is worth mentioning that the distinguishing feature of the Sayyida Ruqayya mihrab, alongside other wooden mihrabs of Egypt, is its portability. This feature has resulted in all sides of the mihrab, including the front, sides, and back, being adorned, making it unparalleled in this regard. This can be potentially used in open-air places. (O'Kane, 2017, 18) points out that under the Fatimid dynasty it was a common practice for a single religious building to have several mihrabs, with a case in point being the tomb of Sayyida Ruqayya, which apart from a fixed mihrab also contained a portable one, probably to be used in the adjacent street or open area when the interior overcrowded shrine failed to accommodate the audience on festive days. The mihrab bears three vertical and a single horizontal inscription bands. We could tentatively read the vertical inscriptions in floriated Kufic from outer to inner: Ayat al-Kursi; verses 54 to 56 of Surah al-A'raf; and verses 36 to 38 of Surah al-Nur.

10. Mausoleum of Sayyida Nafisa, Egypt: The mihrab was made of plane and teak woods for her mausoleum in 532 A.H./137–38 A.D. or 541 A.H./1146–47 A.D. (AlSulaiti, 2010). Now kept at the Museum of Islamic Art in Cairo, it measures 1.92 m high and 0.88 m wide (Lamm, 1936). Crowned by an ogee arch, the exterior facade bears geometric designs, while in the niche area, floral patterns predominate. Available sources are silent about the content of the epigraphs. From careful examination of the photos and seeking consultation from Kufic calligraphy masters, it is possible to surmise that the inscription starts on the outer frieze from Surah al-Fussilat verse 30 and reaches the middle of verse 33 at the end of the vertical band. But in the delineating horizontal band atop the mihrab, the rest of verse 33 lacks evidence. Verses 56 and 57 of surah al-Dukhan were carved in the band on the inner, ogival archivolt. Yet, the preceding and succeeding verses do not belong to that same surah.

11. Mihrab presented by al-Āmir bi-Aḥkām Allāh, Egypt: This mihrab was designed to be portable, possibly intending to relocate on special occasions. Of course, it is currently housed in the Islamic Museum of Cairo. Its ogee arch rests on the pilasters that flank it on both sides, and it is surrounded by four superimposed rectangular panels containing decorations in floral motifs. Traces of paint (painting on wood) are discernible in the niche

area. The crown (hilly) is a large monolith rectangular panel that carries Quranic verses dealing with prayer engraved in Kufic as follows: «بسم الله الرحمن الرحيم», verse 238 of Surah al- Baqara, the closing part of verse 103 of Surah al-Nisa, and a long text reading: «Congregational mosque in the Cairo of al-Mu'izz is among the things that was ordered by our master and lord al-Mansur Abi 'Ali, the Imam al-Amir bi-Ahkam Allah, Commander of the Believers, may God's blessings be upon him, his pure ancestors and his noble descendants, son of the Imam al-Mustansir bi'llah, Commander of the Believers, may God's benedictions be on them all and on their ancestors, the pure imams, the sons of the rightly-directed guides and complete peace until the Day of Judgment. In the months of 519. Praise be to the one God!» (Bloom, 2007, 144).

12. Iskodar Mosque, Tajikistan: On the authority of the Kufic inscriptions, it dates from the 12th century A.D. (Faqih Mirzaei, 2002). The central recess is crowned by an ogee arch above which sits the square pediment, which is in turn outlined by a geometrical frieze worked of separate pieces. The decorative patterns are divided into floral, geometric, and epigraphic.The inscription on the mihrab is a hadith from the Prophet of Islam, reading: « بسم الله الرحمن الرحيم قال النبی علیه السلام من حافظ علی الصف المقدم و التکبیره الاولی اعطاه الله مالا عین رات و لا اذن سمعت فیه و لا خطر علی قلب واصل و لو صارت بحارالسموات و الارض کلها مدادا و الشجار اقلاما و الملائکته کُتّابا لم یقدروا ان یکتبوا ثواب کل» (Faqih Mirzaei, 2002).

General Form and Construction Methods

1. Overall shape and construction methods: With their same function across the Islamic world notwithstanding, what makes some mehrabs look splendid may depend on various factors like the patron(s), indigenous culture, regional architectural style, builders' artistic taste, and, most importantly, raw materials. Among the different materials historically used for making glorious and monumental mihrabs, wood does not seem to be much common, as is evidenced by the infrequency of the extant instances at historical mosques. At the same time, wooden mihrabs show a fairly broad geographic distribution that span China to Egypt (Fig 1).

Fig 1. Map showing the geographic distribution of wooden mihrabs. Source: Authors.

The use of wood for mihrab fashioning does not necessarily imply that it was a locally available material. Consequently, its application was not region-specific. Also, despite wood's inherent limitations, among them biotic and abiotic deteriorations, it has always been a favorite material for mosque builders in making such elements as minibars, mihrabs, doors, and windows. From a technical perspective, the wooden mihrabs considered here fall into two general classes: Fixed and portable. As stated above, portable mihrabs are a monopoly of Egypt. The pertinent buildings (Sayyida Ruqayya, Sayyida Nafisa, and Al-Azhar) all had, at the same time, fixed mihrab(s) of their own. Therefore, the portable varieties were seemingly meant to temporarily expand the congregational prayer space on crowded days such as holidays or religious mourning. On the other hand, the fixed mihrabs are typically installed on the walls facing the qibla. These two varying mihrab forms required two different construction approaches, though it is possible to fix an originally portable mihrab within the wall. A woodwork, be it a door, window, or mihrab, is customarily formed by combining separate joineries. Such a work will give the artisan the leeway to decorate the parts separately before assembling them. Joints can be implemented in different ways and with different qualities, which have a direct relationship with the strength and, hence, the resilience of the final product. The secrets to the durability of these wooden mihrabs are probably the quality of their joints. However, an obvious fact is the use of wooden elements in two parts: The core or main structure (framework), and the detachable fittings (decorations) (Fig 2).

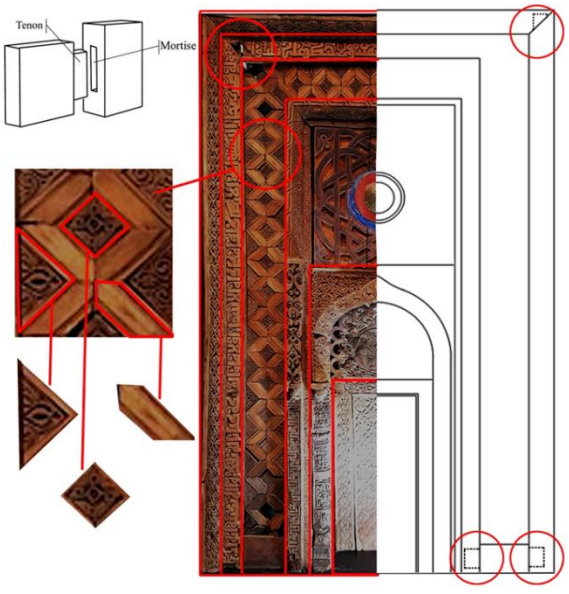


Fig 2. The framework, joints, and fittings of the mihrab at the Iskodar Mosque, Tajikistan. Source: Authors.

A framework is the essential core structure that receives all the components and ensures the integrity and stability of timber structures. Mihrabs being no exception, the framework enabled all the elements, such as inscriptions, panels, and smaller and larger fittings, to join each other to form a consistent whole. The main structure of wooden mihrabs can be classified into two types: Concealed and exposed. In the latter type, the main structure was visible as part of the visual structure of the mihrab, and the decorative accessories were directly set into the structural elements. Related examples include the mihrabs at Shah

Mohiuddin, Al-Azhar, Sayyida Ruqayya, Great Mosque of Xi'an, Iskodar, and Shah Rukn-i-'Alam. One way to distinguish between the integral and separable decorations (i.e., concealed and exposed frameworks) is to look at the framework or core. In the exposed class, it is always visible in the form of thick, narrow timber planks. In this case, an outer framework and one or more vertical and horizontal central beams would consolidate the structural elements. However, in the concealed variety, only decorative fittings are seen pressed next to each other onto the core. Examples include the mihrabs at Taşkın Paşa, Sayyida Nafsia, Abyaneh, Daxuexi, and the Syrian mihrabs. The concealed core structure seemingly meant to disguise the unfinished, rough elements and surfaces. It offered the artisan a broader scope in designing and making densely packed intricate pieces with special techniques such as knife-cutting, fret-saw marquetry, etc. In other words, the hidden core structure was expectedly to enable the artisan to remove the core from the decorating procedure by mounting the ornamental pieces onto it. In this case, the final product would be more delicate and graceful in pattern design and proportion (Fig 3). On the other hand, integrated decorations posed additional challenges for the builder. In particular, the type, size, and diversity of patterns on the visible components of the frame would be more restricted. Corroborating evidence comes from the fact that the exposed cores are always associated with a decrease in the depth of marquetry (a primary criterion for qualitative appraisal of relevant artworks). In such cases, the patterns are carved at shallower depths to preserve timber's mechanical properties (as with the Shah Mohiuddin Mosque). Therefore, the invisibility of the frame can manifestly increase the elegance of inlaid pieces and the depth of carved decorations. Indeed, it should not be passed unmentioned that the frame's visibility state does not affect the aesthetics of decorations per se. For example, at the Abyaneh Jami where the core is hidden, the motifs do not exhibit a significant superiority in variety or elegance over the other related examples. Conversely, at Shah Mohiuddin, all the components, even the visible parts of the framework, are covered in carved ornaments, producing enviable and eye-catching scenes. Builders' talent and expertise also play a pivotal part in the elegance of the produced work, and should not thus be neglected in such inquiries. In terms of shape, the wooden mihrabs, like those in other materials, are rectangular and have a central niche, pilasters on both sides, and an arch on top. Usually, the area above the arch, *viz.*, pediment, offered the best vehicle for decoration, and various forms would be generated around this area. Also, generally, the outermost frieze delineated the entire mihrab and was marked with carved inscriptions of Quranic verses or hadiths. This epigraphic frieze may occur as a single band (e.g., the tomb of Sayyida Nafisa) or several bands (e.g., the Great Mosque of Xi'an). Indeed, rare cases follow a different rule, with the inscription generally placed only above the pediment (Al-Azhar Mosque). The arches tend to be of various types, directly correlating with the arch span and, thus, the overall dimensions of the mihrab (Table 3).

Table 3. Formal comparison of the niche arch in the wooden mihrabs. Source: Authors.

Region	Illustration	Region	Illustration	Region	Illustration
Afghanistan		Iran		Tajikistan	
Egypt		Egypt		Egypt	
China		China		Turkey	
Syria		Syria		Pakistan	

Ogival is the popular type, though circular and horseshoe forms, technically more convoluted and challenging, are also attestable. At the same time, choosing a specific arch form in preference to others might have been inspired by regional and local traditions and culture. For instance, the wooden mihrabs in Syria and Egypt each use only circular and ogival arches, respectively. The greatest span is related to the horseshoe and barrel arches, while for the ogival varieties, the builders preferred smaller spans.

2. Patterns and Decorations: Decorations have historically had a special place in wooden mosque furniture, such as minbar, doors, rahl (book racks), and mihrabs. Hence, the artisans invoked them to increase the aesthetic charges of their works further. In general, the motifs used on mihrabs are split into three classes: geometric, biomorphic floral (Arabesque and Khatai), and epigraphic. The choice of each class was directly contingent on the employed technique, a point to be further discussed later. An attribute common among the geometric and floral motifs is the reiteration of details. Simply put, such motifs are formed from an unlimited duplication of vagireh (the repeat unit). In some mihrabs, geometric motifs

prevail, while epigraphic or floral patterns dominate others. Notably, plant motifs depended on the geometric designs of girih that were carved between them.

A. Floral motifs on wooden mihrabs were generally placed within two types of frames: Non-geometric and geometric. In the first case, plant motifs occur on solid surfaces in either carving or latticework. In the second, they are tightly enclosed by girih geometric motifs. Each of these approaches will have its own advantages and disadvantages. The larger the solid wood surface, the more it will be prone to damages such as warping, cracking, etc. For example, Fig 3 (left) shows a detail of the mihrab of Taşkın Pasha where the floral motifs are integrated into a non-geometric frame, and a deep crack is evident. Yet, at the shrine of Sayyida Nafisa (Fig 4, right), the floral motifs within the geometric frame are in a far better state of preservation.

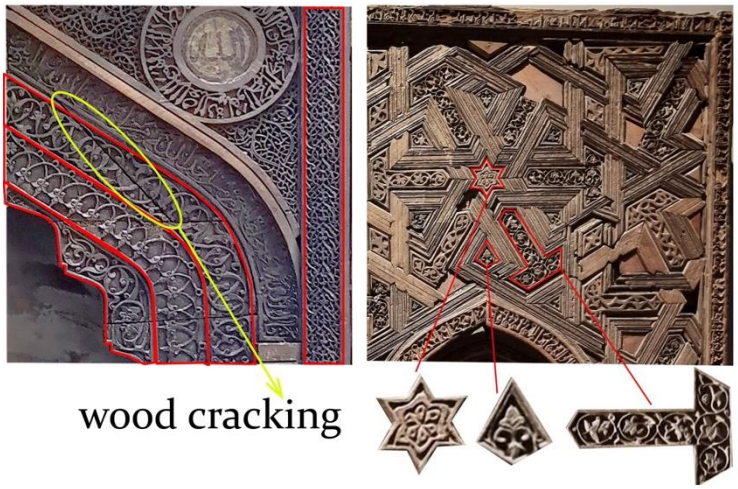


Fig 3. Motifs in non-geometric frames (left) in geometric frames (right). Source: Authors.

b. Apart from the two carving methods and fretwork, geometric patterns also occur in girih designs, which employ such motifs exclusively. More probably, the design of wooden mihrabs in this case adopted an inductive approach. Irrespective of customized dimensions and other construction limitations, the artisan conducted the initial design pragmatically. That is, after determining the dimensions of the frame, they specified the decorative spaces and, accordingly, the motif types. The main limitation inherent in the use of geometric patterns is presented by the points that are contiguous with the surrounding frame. In other words, the designer inexorably had to adhere to the proportions of the geometric girih in the given space. This adherence will amount to the vagireh remaining complete across the entire surface. The various duplication ways of geometric girihs — translation, axial or reflective (hinged), and rotational — acted as a constraint to limit the available alternatives for the designer when deciding on the girih types.

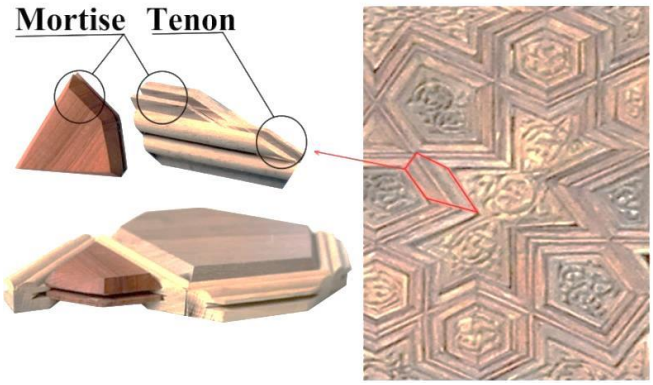


Fig 4. Components of a geometric pattern in the girih technique using the Alat and Loghat method. Source: Authors.

On the other hand, reduced dimensions, apart from lowering the risk of cracking, are also an advantage when it comes to restoration interventions. That is, if a specific piece is damaged, only that single piece will be replaced. Likewise, in the girih decorative method, the fact that all the pieces are connected in the form of "alat" and "loqat" (outlines and the inserts in-between or negative and positive spaces) eliminates the need for additional elements such as backups or braces. This will, in turn, lead to a lighter final structure. Lighter weight becomes all the more critical in the case of portable mihrabs. For this very reason, we see the preference for girih over solid surfaces in both the Sayyida Nafisa and Sayyida Ruqayya portable mihrabs, unlike their earlier counterpart at Al-Azhar. So, in general, application of geometric motifs in mihrabs may often arise from technical preferences (Table 4).

Table 4. Diversity of motifs in wooden mihrabs from the 4th to the 8th century AH. Source: Authors.

Mihrab	Motifs		Dominant motif	Decorative techniques			
	Floral	Geometric		Carved	GIri	Lattice work	turned
Jami of Abyaneh	✓	✓	Vegetal	✓	–	–	✓
Shah Mohiuddin	✓	✓	Geometric	✓	–	–	✓
Taskin Pasa, Damsa	✓	✓	Vegetal	✓	✓	✓	✓
Shah Rukn-i-'Alam	✓	✓	Vegetal	✓	✓	–	✓
Madrasa al-Halawiyya	✓	✓	Geometric	✓	✓	–	✓
Maqam Ibrahim	✓	✓	Geometric	✓	✓	–	–
Xi'an	✓	–	Vegetal	✓	–	–	✓
Xi'an	✓	–	Vegetal	✓	–	–	–
Al-Sayyida Nafisa	✓	✓	Geometric	✓	✓	–	–
Al-Sayyida Ruqayy	✓	✓	Geometric	✓	✓	✓	–

Mihrab	Motifs		Dominant motif	Decorative techniques			
	Floral	Geometric		Carved	GIri	Lattice work	turned
Al-Ahzar	✓	–	Vegetal	✓	–	–	✓
Iskodar	✓	✓	Vegetal	✓	✓	✓	✓

3. Epigraph: As with those in other materials, inscriptions were common elements on wooden mihrabs all around the Islamic world. They often included Quranic verses or hadiths attributed to the Prophet of Islam. Further, they provided information about commissioners (patrons), builders' names, and the date of manufacture. Apart from the script type and letter size, the frequency of inscriptions is another noteworthy parameter. In particular, sometimes (e.g., at Taşkın Pasha) several bands are dedicated to inscriptions, while others (Sayyida Nafisa) only contain a single epigraphic band. Kufic, Thuluth, and Naskh script types were identified for the inscriptions recorded on the investigated mihrabs. Among these, Thulugh and Kufis are the most frequent. From the observations made, it is understood that from the Far East to Egypt, the most popular epigraphic theme is Ayat al-Kursi, a Quranic verse highly regarded by both the Egyptian Fatimid Shiites and the Muslims in China. Also notable is the fact that the Surah al-Fath, with the most essential reference to triumph across the Quran, is sarcastically seen merely on two mihrabs in China, lying far from the Islamic heartland. Inscriptions are continuous verses from one or two surahs. The only exception is the mihrab of Sayyida Nafisa, which combines verses from several surahs. Also, unlike the eleven cases that feature Quranic epigraphs, the mihrab at Iskodar exceptionally bears a prophetic hadith about congregational prayer and competing to pray in the first row. Inscriptions are essential in ascertaining the patrons, builders, and, more importantly, the construction date of mihrabs (Table 5).

Table 5. Inscriptions of wooden mihrabs remaining from the 5th to the 8th centuries AH. Source: Authors.

Location	Inscription			Script	Location	Inscription			Script
	Content	Builder	Construction date			Content	Builder	Construction date	
Abyaneh, Iran	Ayat al-Kursi; Surah al- Al Imran; Asmaʾ al-Husna	✓	✓	Kufic, quasi-Naskh	Taşkın Pasha	Surahs al-Ikhlas, al-Ahqaf, al-Hashr, al-Tawba, and Ayat al-Kursi	-	-	Thuluth
Al-Halawiyya , Syria	Surahs al-Nur, al-Tawbah and al-Waqiʾah; patrons' names	✓	✓	Kufic, Thuluth	Maqam Ibrahim in Salihin	Illegible	Unspecified	Unspecified	Kufic
Iskodar, Tajikstan	Hadith from the Prophet	-	-	Kufic	Shah Mohiuddin, Afghanistan	Surah al-Fatiha, Ikhlas; Ayat al-Kursi	✓	-	Kufic
Daxuexi, China	Surah al-Fath; Ayat al-Kursi	-	-	Thuluth	The Great Mosque of Xi' an, China	Surahs al-Ikhlas, al-Fath, al-Tawba; Al-Asma' al-Husna	-	-	Thuluth
Sayyida Nafisa, Egypt	Surahs al-Fulat, Dukhan, and Zariyat	✓	✓	Kufic	Sayyida Ruqayya, Egypt	Ayat al-Kursi; surahs al-Aʾraf, al-Nur; Al-Asma' al-Husna	✓	✓	Kufic
Al-Azhar, Egypt	Surahs al-Baqarah, and an-Nisaʾ	✓	✓	Kufic	Shah Rukn-i-ʿ Alam, Pakistan	Ayat al-Kursi	-	-	Thuluth

Conclusion

In overall form, wooden mihrabs show no significant disparities with those in masonry materials such as stone, gypsum, and brick. Thus, the difference in substance notwithstanding, the artisans tried to remain loyal to the traditional mihrab design. A noteworthy point about wooden mihrabs is that they ostensibly flourished between the 11th and 14th centuries A.D., as no examples are known from the preceding or the succeeding periods. Wood is a material offered to the manufacturer/orderer, and the specific advantages are reduced structural weight and portability. The mihrabs of Egypt exclusively display such attributes, and the artisans in the remaining regions failed to take advantage of them. In all the mihrabs considered here, the arch shape follows almost the same pattern, except for the crenellated and the semi-circular instances. From a technical perspective, two main construction approaches are distinguishable. In the first, decorative patterns were also carved directly onto the exposed framework, apart from the intervening spaces. Relevant examples include the mihrabs at Shah Mohiuddin, Al-Azhar, Sayyida Ruqayya, Xi'an, Iskodar, and Shah Rukn-i-'Alam. In the second technique, the decorations mask the main framework (viz. those at Taşkın Pasha, Sayyida Nafisa, Abyaneh, Daxuexi, and the Syrian mihrabs). Obviously, the second class shows higher elegance, motif density, decoration diversity, and carving depth. Three motifs, viz. epigraphic, geometric, and floral, are attested on the wooden mihrabs, with the former being far more recurrent than the latter. A plausibly construable premise from the qualitative and quantitative analyses of the inscriptions is that the further one moves away from the Muslim lands' geographic core, Quranic inscriptions occupy the larger parts of mihrab surfaces as the most concrete visualization of the Islamic religious faith. In particular, in the regions now forming Egypt and Syria, which were among the first conquered by Muslims, the motifs are primarily abstract, with the Quranic verses making a more minor contribution to the overall composition of the mihrabs' surface decorations than the floral and geometric patterns. The claim is further corroborated by the walls clad in Quranic epigraphs at the Great Mosque of Xi'an, not to mention the exclusive attestation of Surah al-Fath on the mihrabs in China. This hypothesis is by no means extendable a priori to other potential mihrabs in the Islamic world and simply applies to the present study.

Author Contributions

This research has been written with the participation of all authors. All authors have discussed the results and reviewed and approved the final manuscript.

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Conflict of Interest

The author (s) declare that there are no potential conflicts of interest related to this research, in writing, and publication of this article

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