TIMBER AND FLORA FROM KAFIR-KALA IN SAMARKAND: UNVEILING SPECIES AND PRACTICAL APPLICATIONS

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This article primarily focuses on the identification of types and practical utilizations of wooden and plant remains discovered in the pre-Islamic layers during the excavations of the monumental complex at the citadel of Kafir-kala by the Uzbek-Japanese expedition. The current study reveals the presence of five different types of timber: poplar (*populus; salicaceae*), willow (*salix; salicaceae*), ash (*fraxinus; oleaceae*), sumac (*rhus; anacardiaceae*), as well as diffusely porous wood (*rosaceae?*) and various other plant species. Notably, poplar (*populus; salicaceae*) stands out as the predominant variety. The application of poplar is further evident in the crafting of wooden panels, which portray the goddess Nana and a congregation of Sogdians venerating her from the central room (15/16) of the citadel. Various tree and plant remains along with unique artifacts found in the groove — the seam between the main part of the central sufa and the lower step — prompt speculation regarding the room’s function as an altar-chapel presumably dedicated to the goddess Nana. This leads us to consider a nexus between the citadel complex and ritual ceremonies, potentially involving prayers and festivals dedicated to this deity. Other gatherings encompassing political and various events may have also taken place within this monumental complex.

САМАРҚАНДДАГИ ҚОФИРҚАЛЪАДАН ТОПИЛГАН ЁҒОЧ ВА ЎСИМЛИКЛАР: УЛАРНИНГ ТУРЛАРИ ВА АМАЛИЙ ҚЎЛЛАНИШИ

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Калит сўзлар: Сўғдиёна, Кофирқалъа, панно, дарахт, ўсимлик қолдиқлари

Ушбу мақола Кофирқалъанинг цитаделида жойлашган йирик меморий мажмуани қазиш жараёнида ўзбек-япон экспедицияси томонидан топилган ва йиғиб олинган ёғоч ва ўсимлик топилмаларининг турларини ва уларнинг амалий қўлланишини аниқлашга бағишланган. Тадқиқот натижалари терак ((*populus; salicaceae*), мажнунтол (*salix; salicaceae*), шумтол (*fraxinus; oleaceae*), сумак (*rhus; anacardiaceae*), сочиқ ғовакли ёғоч (*rosaceae?*) каби беш хил турдаги ёғоч ва бошқа ўсимликларни мавжудлигини кўрсатди. Улар орасида энг кўп фойдаланилган ёғоч терак (*populus; salicaceae*) эканлиги маълум бўлди. Мажмуанинг энг ички марказий қисми — 15/16 хонадан топилган маъбуда Нана ва унга сажда қилаётган бир гуруҳ сўғдлар тасвирланган ёғоч панноларида теракнинг кенг қўлланилганлиги яққол намоён бўлган. Марказий асосий суфа ва унга туташган пастки зина орасидаги хандақдан топилган бир қанча ёғоч ва ўсимлик намуналари 15/16-хона маъбуда Нанага бағишланган бўлиши ва жумладан ушбу мажмуа шу маъбуда учун ритуал ибодатлар ва маросимларини ўтказиш вазифасини ҳам ўтаган бўлиши мумкинлигини кўрсатади.

1. Introduction

Since 2013, the collaborative endeavors of the Uzbek-Japanese Expedition have primarily focused on the archaeological explorations, involving excavations and survey of Kafir-kala in Samarkand, Uzbekistan. Among the diverse array of materials discovered by the expedition to date, numerous carbonized wooden and plant materials acquired from the pre-Islamic layers at the citadel as well as *shahristan* of Kafir-kala stand out for their unique nature.

In many Central Asian regions, with exceptions for those with extreme aridity like deserts or high moisture content such as wetlands, the typical climatic and soil conditions of lowlands often lead to the thorough decomposition of organic objects, including timber and flora, leaving next to nothing for contemporary investigators to study. However, such rare materials have survived in a carbonized form in the 6-8th century layers at Kafir-kala.

A colossal fire appears to have led to the collapse of the monumental complex at the citadel of Kafir-kala in the early 8th century CE, presumably causing devastation to the lives of the inhabitants (Begmatov et. al. 2020). This calamitous event has resulted in the carbonization of wooden and other organic materials, facilitating their survival until the present day.

The identification of wood species from late antique and early mediaeval layers of archaeological sites in Central Asia has been a rare opportunity. Hence, we consider it essential to present our findings on the identification of wood as well as plant objects excavated from the fire layer of the Kafir-kala citadel. In addition, we aim to discuss the historical and practical applications of these materials, seeking insights that may contribute to a broader interpretation of the features of the citadel that remain tentatively examined and elucidated.

2. Overview of the site and discussion of the materials

Kafir-kala, meaning “fortress of the infidels”, is located approximately 10 kilometers south-east of Samarkand, Uzbekistan, along the left bank of the Dargom canal, sourced from the Zarafshan river. It is presumably equated with Rewdat, the Royal Residence of the Samarkand kings, Ikhshids as mentioned in the early Arabic sources (Sukharev 1935–36). The surviving remains of the site cover an area of approximately 16 hectares, including a citadel, inner city – shahristan, and rabat (Mantellini and Berdimurodov 2005). The citadel is characterized by an elevated position and square shape measuring approximately 75x75 m with towers positioned at all four corners. Excavations initiated by the Uzbek-Japanese expedition since 2013 have unveiled that the entire citadel was covered by a layer containing a substantial quantity of ash and charcoal, the result of a catastrophic fire. Based on numismatic data obtained from the citadel, the fire is presumed to have occurred towards the end of the reign of King Tarkhun (700–710) or shortly thereafter. It is therefore assumed to have resulted from an attack by Arab Muslim forces led by the commander Qutaiba ibn Muslim during their conquest of Samarkand in 712 (Begmatov et. al. 2016, 2018, 2020; Murakami et. al. 2019).

The citadel features a sizeable monumental complex encompassing a courtyard with two long sufa, mud benches arranged along its east-west walls, a spacious platform and five rooms in the northern half. The walls enclosing the courtyard which separate it from the outer corridors, were adorned with wall paintings. The central innermost chamber within the complex, labeled as room 15/16, holds particular significance, housing wooden carvings, which depict the goddess Nana and her worshipper along with various other distinctive artifacts, including precious stones, gold and silver decorations like necklace and pendants. While the prevailing assumption suggests that this space might have functioned as the throne chamber for the Ikhshids of Samarkand, the analysis of wood and plant samples collected from this room proposes an alternative, potentially more plausible interpretation – room 15/16 could have served as an altar-chapel dedicated to the goddess Nana.



Figure 1. Courtyard, platform, and innermost rooms in the northern half of the complex
Рис. 1. Внутренний двор, платформа и внутренние помещения в северной половине комплекса
1-расм. Мажмуанинг шимолий ярмидаги ҳовли, платформа ва ички хоналар



Figure 2. Room 15/16 featuring a floor paved with baked tiles, an inner platform (or sufa), an adjacent central step containing a groove and two side staircases
Рис. 2. Помещение 15/16 с полом, выложенным обожженной плиткой, внутренней платформой (или суфой), примыкающей к ней центральной приступкой со щелой и двумя боковыми лестницами
2-расм. Пиширилган плиткалар билан қопланган 15/16-хона поли, ички платформа ёки суфа, унга бириктиритилган хандақли марказий зина ва иккита ён зинапояни ўзида мужассам қилган

The chamber adjacent to the east of room 15/16, namely room 17, appears to have functioned as a storage space. Likewise, the westernmost room labeled 12, which extends across the neighboring room 13 to the west, also appears to have been utilized for the storage or pantry of various food, including fruit, vegetable, grain and other kinds of beverages (Fig. 1, 2).

A noteworthy discovery in the courtyard includes a large number of sealings, which have presumably been attached to letters, documents and other objects. Some of the sealings were unearthed in and around a hearth, which suggests that the objects the sealings were attached to might have been intentionally burned (Begmatov et. al. 2020). Additionally, remnants of a human skeleton were also found. All the findings acquired thus far imply that this site played a particularly strategic role in the pre-Islamic and early Islamic Sogdiana.

A substantial quantity of wooden items was excavated from the fire layer, and most of them underwent complete carbonization. Due to the severe damage caused by the intense heat exposure, only a few items managed to retain their original shape. However, we could observe traces of carvings or other shapes and ornaments. It is presumed that these items include plinths and beams utilized for structural support, as well as materials for roofing, furniture, and carved decorations. In the subsequent sections, we delve into the identification of the source trees and plants for 17 collected samples.

3. Methods

Given that many fragments of carbonized wooden objects have detached due to the severe damage from heating, the materials used for species identification were often fragments that could not be replaced in their original positions.

The process of tree identification involved cutting small fragments to observe the transverse sections, straight grain sections, and plank surfaces. Subsequently, these fragments were affixed onto a scanning electron microscope (SEM) sample stand using conductive adhesive, followed by coating them with the metal palladium to enhance conductivity. Utilizing a scanning electron microscope (JSM5310LV, JEOL, Tokyo), the three sections were observed in order to identify the source trees. Yoko Watanabe has conducted the tree identifications.

Following the tree identification results, an examination of the morphology and archaeological circumstances of each wooden object was carried out to discern their potential historical uses.

4. Identified wood and plant species

The descriptions of the species identified by observing 17 samples and their anatomical features are presented below. These findings are also summarized in Table 1.

1) Populus; Salicaceae

This group of species exhibits characteristics consistent with diffuse porous wood. The perforation plates of the vessel elements consist of simple (single) perforations, and the vessel element walls lack spiral thickening. The arrangement of the vessel element facing the wall pitting is alternating. The axial parenchyma is bounded by the growth rings, with all ray parenchyma arranged in single rows, and all structural cells are procumbent. Storied arrangements were not observed. Based on these features, the samples from Kafir-kala have been identified as Populus, commonly known as poplar. This kind is unsurprisingly predominant among the samples collected from the citadel of Kafir-kala, as it is well-suited to the Central Asian climate, and grows rapidly to a large size.

2) Salix; Salicaceae

This species features diffuse porous wood; its perforation plates of the vessel elements consist of simple (single) perforations. The vessel element walls do not have spiral thickening. The ray

Table 1

№	Fig.	Unearthed from	Use	Type of tree
1	7b	Room 15/16	Wooden panel 1	*Populus.sp*
2	3	Trench 5a	Pillar	*Populus.sp*
3	5	Trench N6	Braid (basket)	*Salix.sp?*
4	6	North-east tower	Roof	Monocotyledonous plant
5	4	South-west tower	Log for building?	*Populus.sp*
6	10	Room 15/16	Unknown	*Populus.sp*
7	10	Room 15/16	Unknown	*Populus.sp*
8	9a	Room 15/16	Unknown	*Fraxinus.sp.*
9	10	Room 15/16	Unknown	*Populus.sp*
10	9a	Room 15/16	Square timber (furniture?)	*Populus.sp*
11	9b	Room 15/16	Wood frame (furniture)	*Salix.sp*
12	7b	Room 15/16	Wood bar or stick carving	*Populus.sp*
13-1	8	Room 15/16	Offering, incense?	Branch of broadleaf sapling?
13-2	8	Room 15/16	Offering, incense?	Root of woody plants
13-3	8	Room 15/16	Offering, incense?	monocotyledon
13-4	8	Room 15/16	Offering, incense?	*Rhus.sp*
14	9b	Room 15/16	Furniture leg or pillar?	*Populus.sp*
15	9c	Room 15/16	Furniture leg or pillar?	*Populus.sp*
16	9c	Room 15/16	Furniture	Diffuse porous wood
17	7b	Room 15/16	Wooden panel 2	*Populus.sp*

parenchyma is single row heterologous, typically with 2 to 4 rows of upright/square ray cells at the edges. The arrangement of the vessel element facing the wall pitting is alternating. The interstitial pores in the vessel element ray parenchyma are cribriform.

3) Fraxinus; Oleaceae

This type entails ring porous wood; its vessel elements outside the pore region are scattered. The perforation plates of the vessel elements consist of simple (single) perforations. The arrangement of the vessel element facing the wall pitting is alternating and consists of extremely small pits. The vessel element walls do not have spiral thickening. The axial parenchyma is peripheral, and they are bounded by the growth rings. The width of the ray parenchyma is 1 to 3 rows. All structural cells are procumbent. Based on the above features, this sample was identified as *Fraxinus*.

4) Rhus; Anacardiaceae

This species is characterized by ring porous wood; its perforation plates of the vessel elements consist of simple (single) perforations. The vessel element walls have spiral thickening. The arrangement of the vessel element facing the wall pitting is alternating and dense. The ray parenchyma is heterologous, with a width of 1 to 3 rows. Based on the above features and consideration of the region, we identified this sample as *Rhus*.

5) Diffuse porous wood

This is a diffuse porous timber sample with clear growth ring borders; over 90% of its vessel elements are isolated pores. The perforation plates of the vessel elements consist of simple (single) perforations. The ray parenchyma is homologous, with a width of 1 to 3 rows. All structural cells are procumbent. Although its features closely resemble those of *Rosaceae*, the tree family for this wood sample could not be precisely identified.

6) Monocotyledonous plants

The vascular bundle arrangement of these plant samples is *atactostele*. The cells of the vascular bundle sheath are relatively thin. The vascular bundle, which is made up of three parts – the protoxylem on the adaxial side, the two metaxylem on the right and left, and the phloem on the abaxial side – shows scattered culm of monocotyledonous plants.

5. Discussion of practical applications and historical usage

1) Building material – pillar; sample № 2, Fig. 3.

Identification result: *Populus*; location of excavation: Trench 5a.

A wooden object with an approximate diameter of 50 cm was unearthed in a vertical position within Trench 5a, situated in the southeast corner of the citadel. Its positioning leads us to speculate that it likely served as a building pillar (Fig. 3). The wood belongs to the *Populus* family, commonly referred to as poplar, a prevalent and widely utilized construction material in Uzbekistan and across Central Asia[1].

2) Building material - beam (?); sample № 5, Fig. 4.

Identification: *Populus*; location of excavation: Southwestern tower

This object is presumed to be a beam or another construction material, which is made from a tree presumably belonging to the *Populus* family, which is consistent with the composition of the pillars. Similar building materials, possibly beams, were also excavated in room 15/16 and various other locations.

3) Woven object; sample № 3, Fig. 5.

Identification: Willow - *Salix*(?); location of excavation: Trench N6

This sample has been excavated from the top of a *sufa* (bench) located in the northeastern part of the citadel. Its complete morphology remains uncertain due to the limited instances of observation. However, the discovery of a series of thin wooden items joined together immediately after this sample’s acquirement, suggests that it might be a basket-like woven object. Willow, being suitable for the manufacturing of woven items, aligns well with the characteristics of this find. Even today in Uzbekistan, willow and mulberry are used in the crafting of woven plates and similar items.

4) Roof material; sample №: 4, Fig. 6.

Identification: Monocotyledonous plant; location of excavation: Northeastern tower

This sample is excavated from the tower located at the northeast corner of the citadel. It appears to be a flat woven object with mud affixed to its surface, which suggests that it might have been utilized as a roofing material. The source tree was identified as a monocotyledonous plant, likely belonging to the *Poaceae* family. Plants of the *Poaceae* family are indigenous to dry riverbeds and similar locations. In modern-day Uzbekistan, plants from this family are continued to be used for thatching the roofs of private homes and other structures.

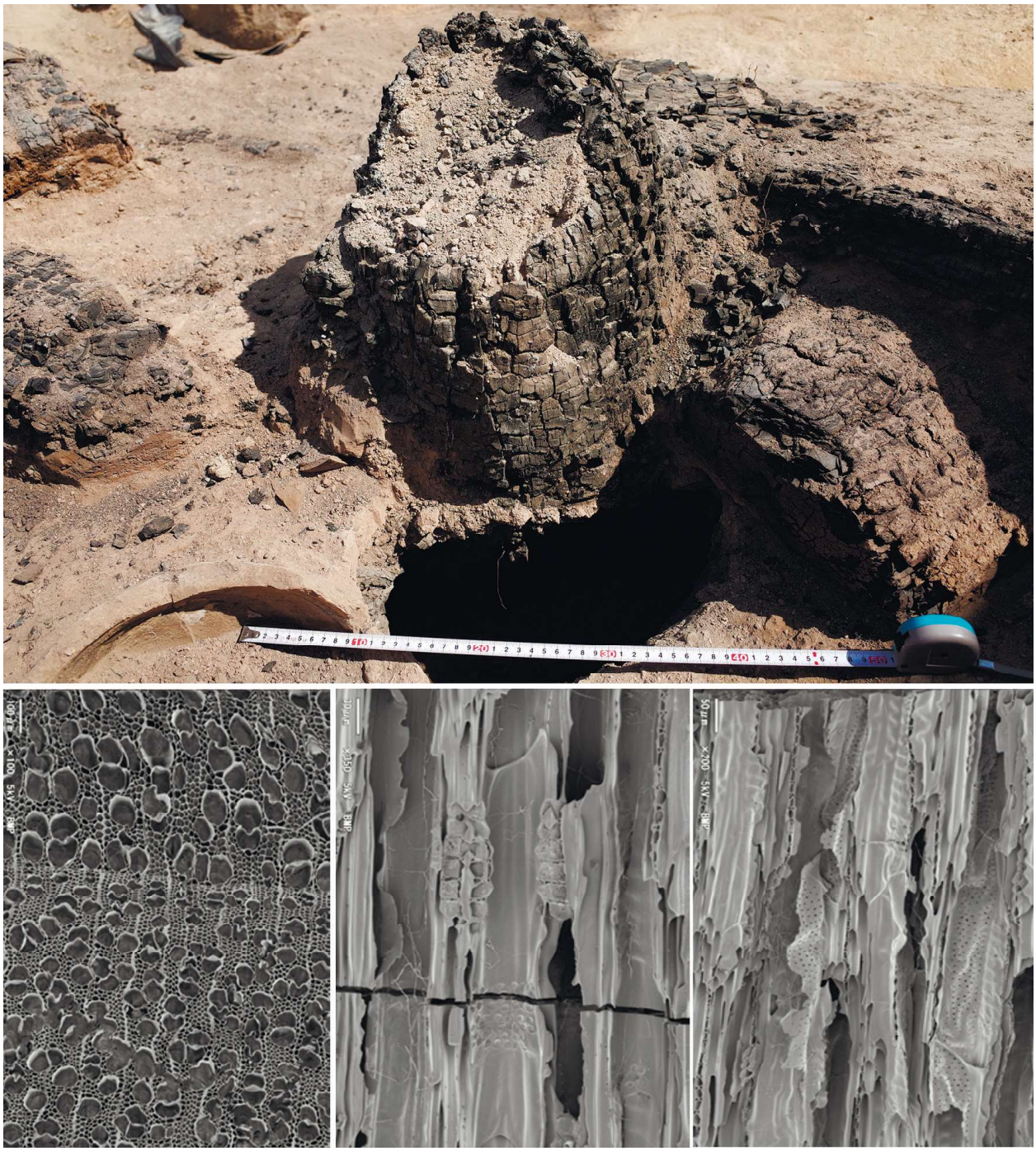


Figure 3. Pillar made of poplar No. 2: its transverse, straight grain section, and plank surfaces (from left to right)
Рис. 3. Столб из тополя № 2: его поперечное, прямое сечение и поверхности планок (слева направо)
3-расм. №2 теракдан ясалган устун: унинг кўндаланг, тўғри кесмалари ва юза қисми (чапдан ўнгга)

5) Wood carvings; samples № 1, 12, 17, Fig. 7 b.

Identification: poplar – *Populus Salicaceae*; location of excavation: Room 15/16

The application of *populus* appears to have extended to the field of carving art, likely owing to its accessibility, softness, and suitability for intricate fashion. Samples № 1 and № 17 are identified as fragments of poplar extracted from carved wooden panels discovered on the baked tile floor of room 15/16, the central innermost area of the citadel. Another sample № 12, a rectangular piece from a bar or stick-like wood carving recovered from the central staircase also appears to be crafted from poplar. This stick carving elaborately depicts a group of mainly female human busts.

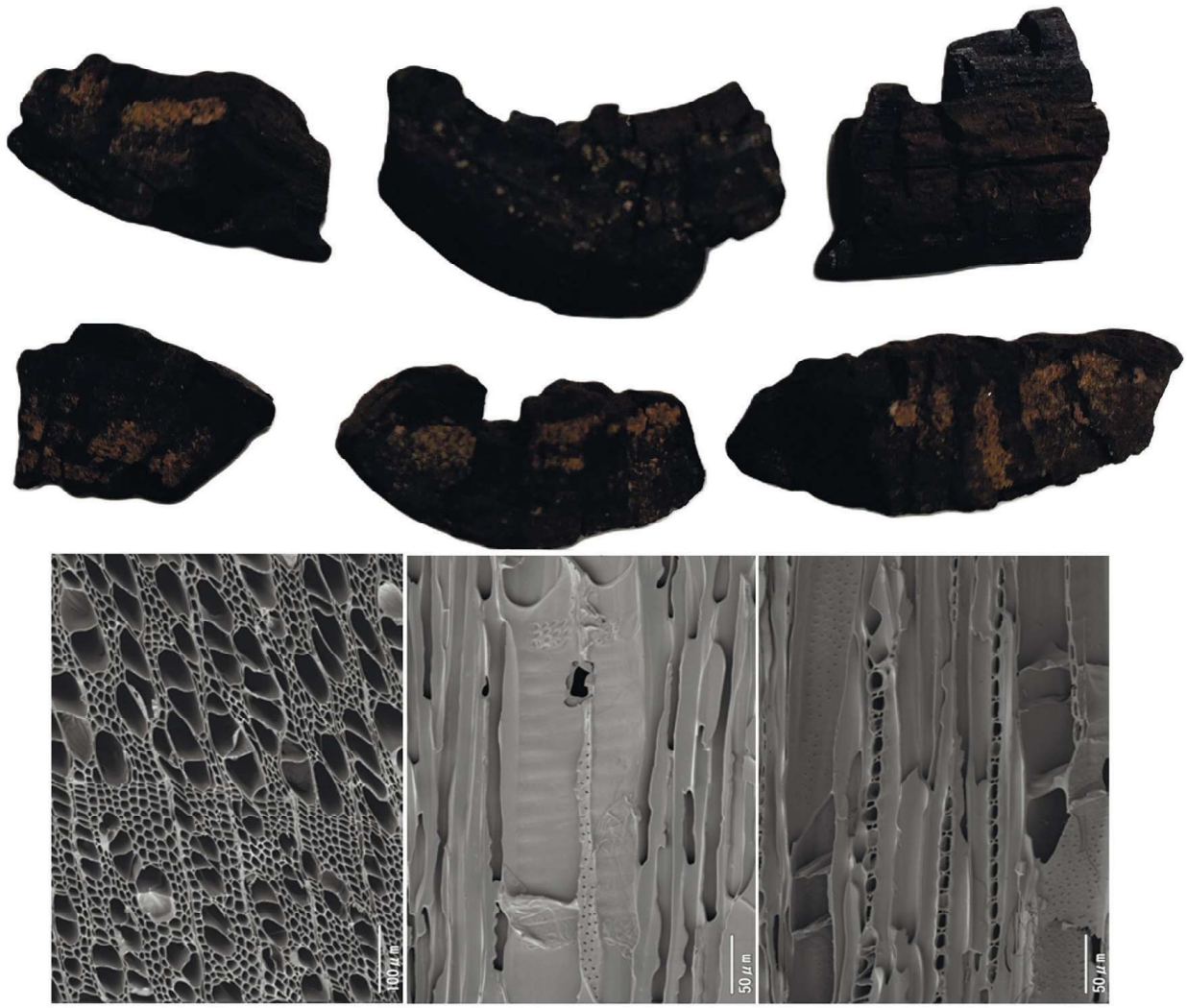


Figure 4. No. 5. Populus: transverse section straight grain section plank surface
Рис. 4. № 5. Тополь: поперечный разрез прямое сечение поверхность планок
4-расм. № 5. Терак: кўндаланг кесими тўғри кесим юзаси

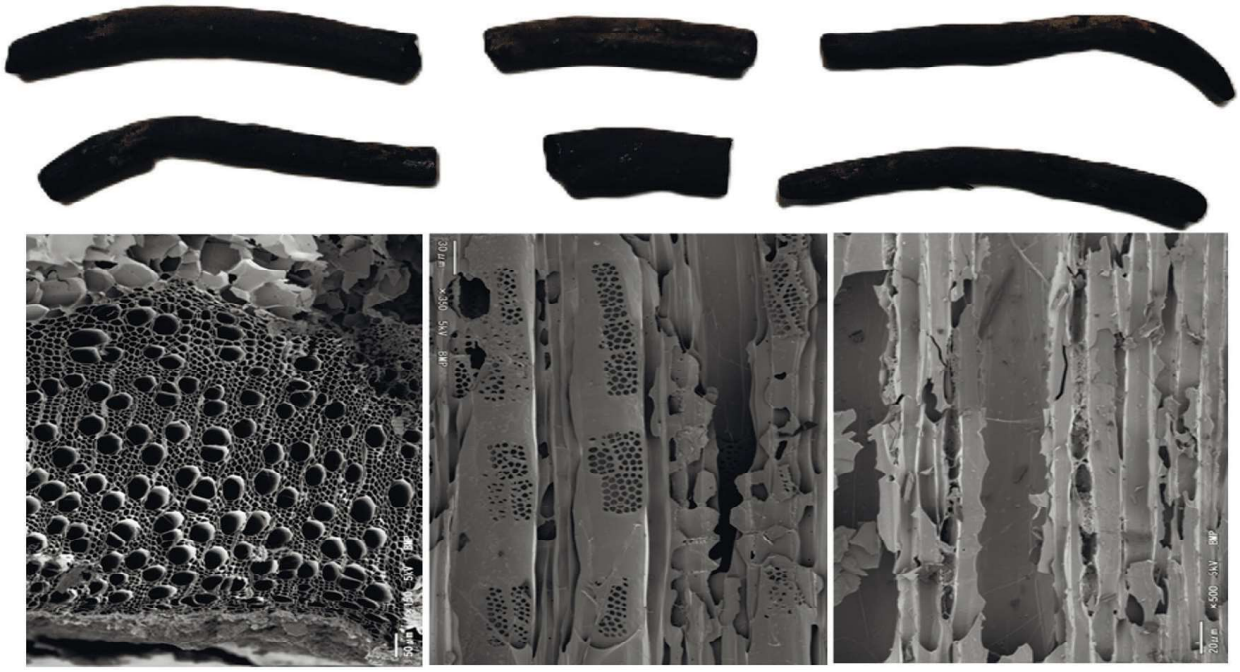
Despite undergoing nearly complete carbonization, the objects yielding these samples remarkably preserve images. The rectangular and arch-shaped wooden panels exhibit somewhat ideal condition, allowing for the visibility of sophisticated details such as facial expressions, the hair, eyelashes, pupils of their eyes, diverse patterns on their clothing, and other notable features of individuals who form two different congregations on two panels venerating the central figures – the two armed and four armed goddesses Nana, a key deity in the pantheon of pre-Islamic Central Asians, particularly among the Sogdians (Fig. 7a.).

The wooden panels, the sources of samples No. 1 and No. 17 originate, are believed to have been crafted around the 6th to early 7th century CE. Notably, there are no other well-preserved examples in Central Asia that capture this particular scene. The subsequent samples, potentially purposed as firewood or plants for burning, obtained from the central staircase of room 15/16 may indicate a ritual function. This could be connected to the worship of this deity depicted in these distinctive carvings.

6) Incense (?), offering; samples №: 13-1, 13-2, 13-3, 13-4, Fig. 8a-e.

Identification: Branches of broadleaf sapling(?), sumac - *Rhus* family, roots of woody plant, monocotyledonous plant,

Location of excavation: Room 15/16, upper surface in the gap of the central staircase.



transverse section
поперечный разрез
кўндаланг кесим

straight grain section
прямое сечение
тўғри кесим

plank surface
поверхность планок
юзаси

Figure 5. No. 3 Willow sticks *Рис. 5. № 3. Ивовые палочки* *5-расм. № 3. Мажнунтол новдалари*

Numerous small pieces of wood and plant material were collected from the groove, the seam located between the main part of the central *sufa* or platform and the lower staircase attached to it in the central area of room 15/16. Our analysis revealed that these timber and flora fragments include branches or stalks and roots representing at least four distinct types, such as a broadleaf sapling, woody plant, monocotyledonous plant, and sumac. Alongside these botanical discoveries, various items, including clay lamps, animal bones, jewelry, a Sogdian copper coin were also acquired from the groove.

The presence of these diverse artifacts within the groove of the central staircase, particularly clay lamps, wood and plant objects may indicate a potential ceremonial function for room 15/16, possibly associated with the worship of the goddess Nana, as mentioned above. While the precise purposes of the identified plants and tree branches remain elusive, it seems conceivable that these served as offerings or/and as incense placed for burning in the groove, which may have essentially functioned as an altar. The practice of burning plants with perceived ritualistic potency, still observed in contemporary Central Asia. This may add an intriguing layer of continuity to these ancient ritual practices.[2]

Room 15/16 stands out with its floor paved with baked tiles; a distinctive feature confirmed exclusively in this space within the entire pre-Islamic layer of the citadel. This chamber houses a prominent *sufa* or platform in the innermost section, accompanied by three staircases attached to it - a central, lengthy one with a groove and two narrower ones from the east and west. Among the expedition members, there has been a discussion speculating the platform or *sufa*, where the staircases lead, could be the location of the royal throne. Although this possibility may not be ruled out, the presence of a groove in between the central lower main staircase and the platform, filled with soft and dry ash-like soil, seems to weaken this probability, and instead supports the assumption that this chamber may have functioned as an altar-chapel. The wood and plant objects may have been used at the altar, for offerings and/or burning incense. In light of the wooden boards highlighting the goddess Nana from room 15/16, it seems justifiable that this space functioned



cross - and transverse section of warpransverse
поперечный разрез основы
ҳалқанинг кўндаланг кесими

section of weft
поперечный разрез утка
тўқиманинг кўндаланг кесими

Figure 6. No. 4 Monocotyledonous plant
Рис. 6. № 4 Однодольное растение
6-расм. № 4 Бир паллали ўсимлик

as the altar-chapel for this deity. Notably, the novel discovery of a palace in the north-western area of the *shahristan* prompts the assumption that the function of the complex might have been connected to ritual and ceremonial gatherings, potentially involving the goddess Nana. According to Grenet (2020), the congregation on the rectangular board represents the Sogdian civic body Naf. It seems conceivable that such gatherings of the Naf venerating Nana as portrayed in the panels might have taken place at this complex (7a.). Other meetings including political and various events may have also taken place within this monumental complex.

7) Furniture (?) or other similar purposes; samples № 8, 10, 11, 14, 15, 16, Fig. 9a-e.

Identification: *Populus; Salix; Fraxinus*, diffuse-porous wood (*Rosaceae?*)

Location of excavation: Room 15/16



Figure 7a. Rectangular wooden panel portraying goddess and worshippers (drawing by M. Sultanova)
Рис. 7а. Прямоугольное деревянное панно с изображением богини и поклоняющихся (прорисовка М. Султановой)
7а-расм. Маъбуда ва топинувчилар тасвирланган тўғрибурчак ёғоч панно (М. Султонова чизмаси)

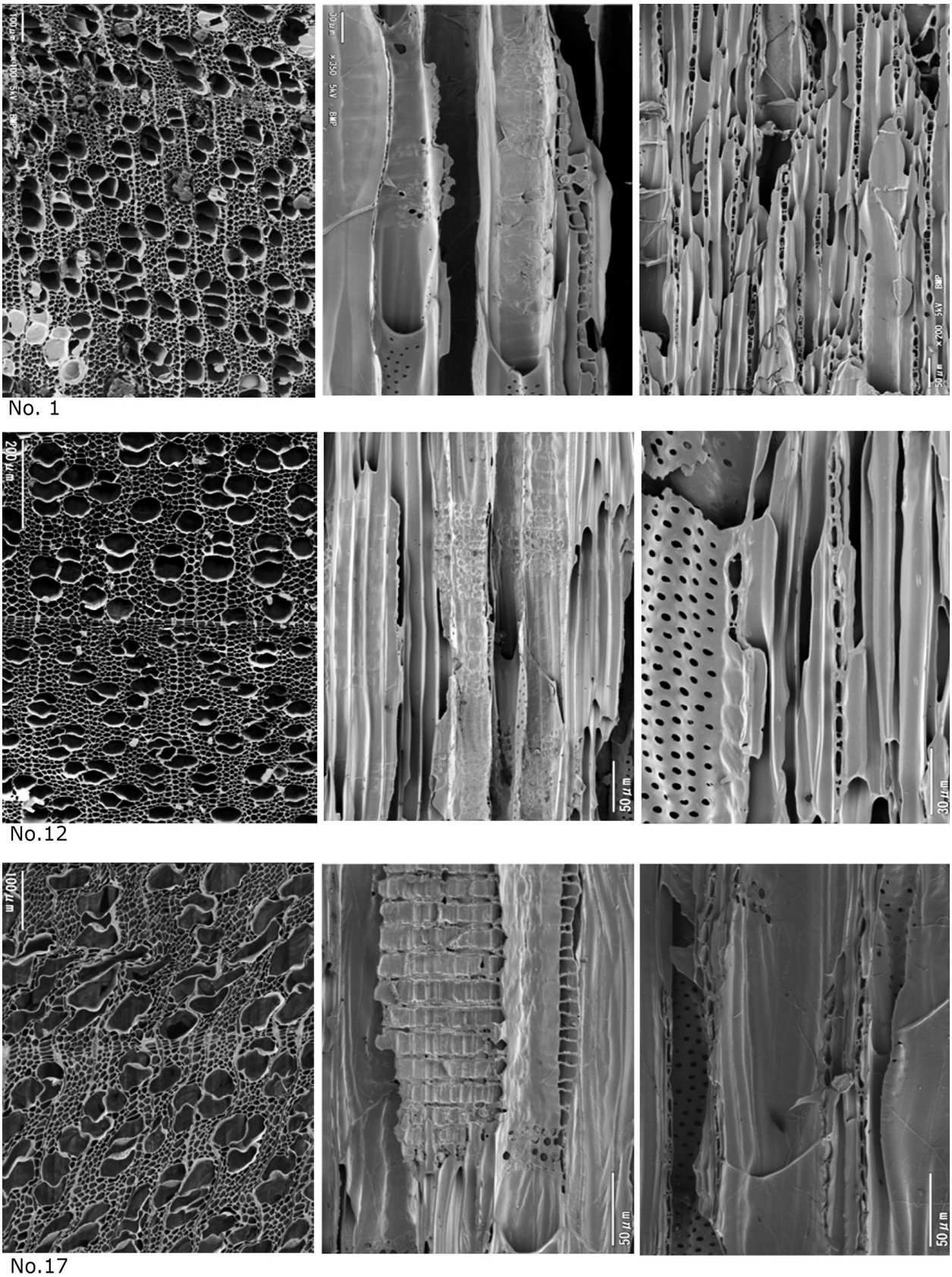
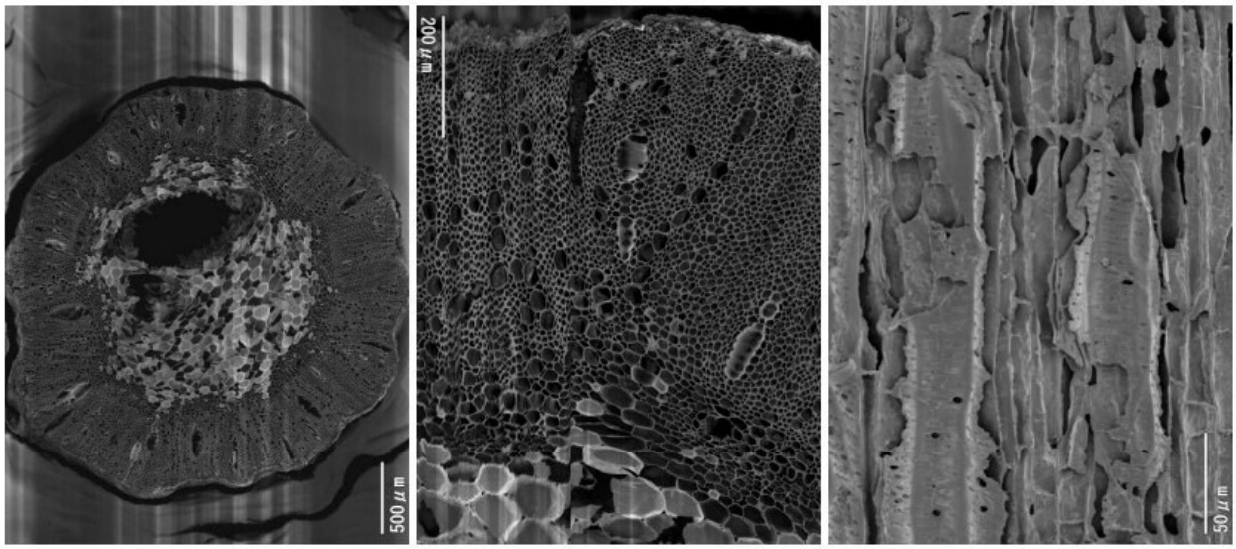


Figure 7b. Samples Nos. 1, 12, 17; from left: transverse, straight grain sections plank surface
Рис. 7b. Образцы №№ 1, 12, 17; слева направо: поперечный, прямой разрезы, поверхность планок
7б-расм. № 1, 12, 17 намуналари; чапдан ўнгга: кўндаланг, тўғри кесмалари, юзаси

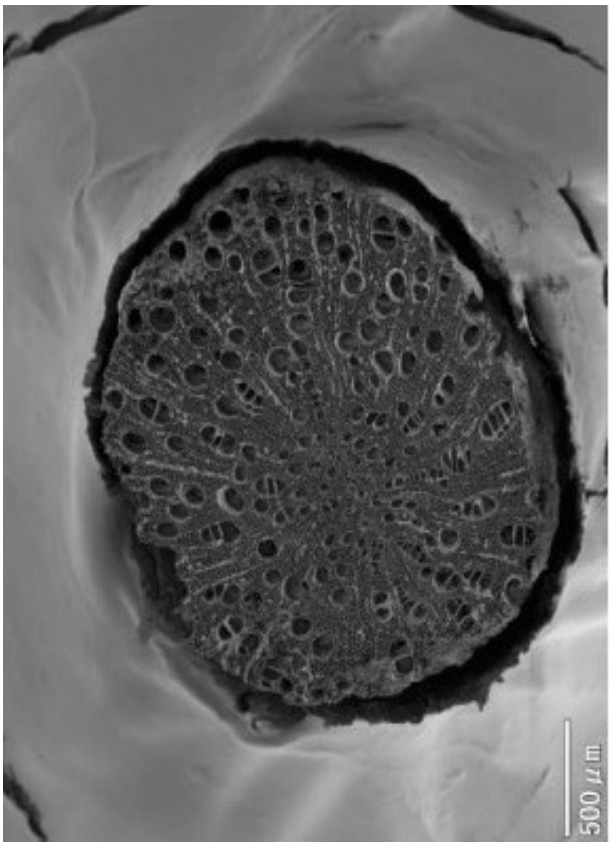


Figure 8a. Samples Nos. 13-1, 13-2, 13-3, 13-4. Firewood or plant for burning (?)
Рис. 8а. Образцы № 13-1, 13-2, 13-3, 13-4. Дрова или растение для сжигания (?)
8а-расм. Ёқиш(?) мақсадида ишлатилган ўсимлик намуналари № 13-1, 13-2, 13-3, 13-4

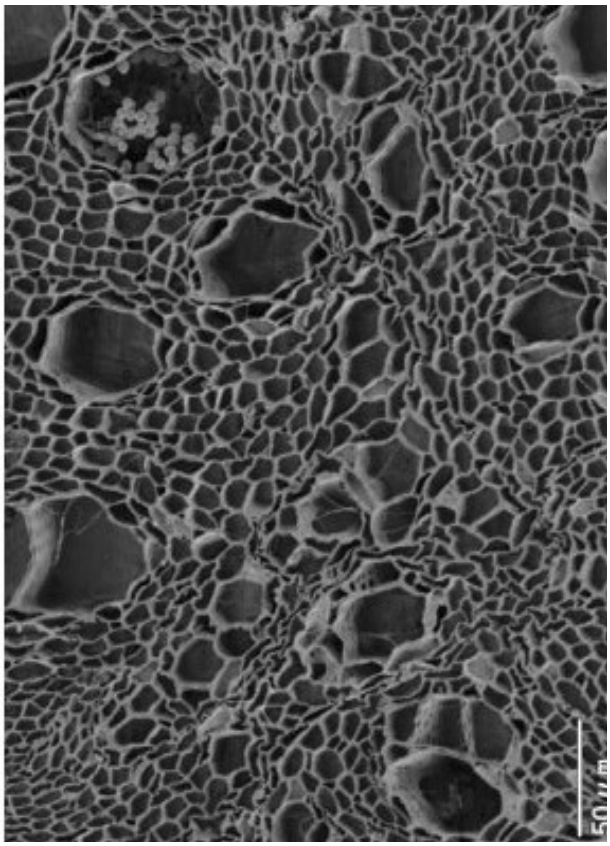


transverse section *straight grain section* *plank surface*

Figure 8b. No. 13-1. Branch of broadleaf sapling
Рис. 8b. № 13-1. Ветка широколиственного саженца
8б-расм. № 13-1. Кенг баргли ниҳолнинг новдаси



transverse section
поперечный разрез
кўндаланг кесими

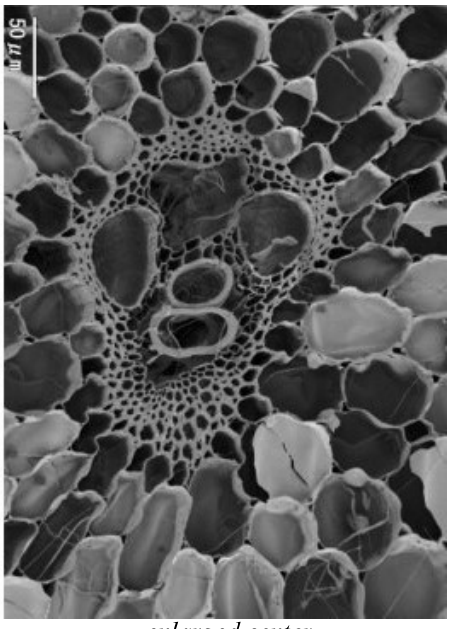


enlarged center
увеличенный центр
катталаштирилган маркази

Figure 8c. No. 13-2. Woody plant roots
Рис. 8с. № 13-2. Корни древесных растений
8с-расм. № 13-2. Ёғочли ўсимлик илдизлари

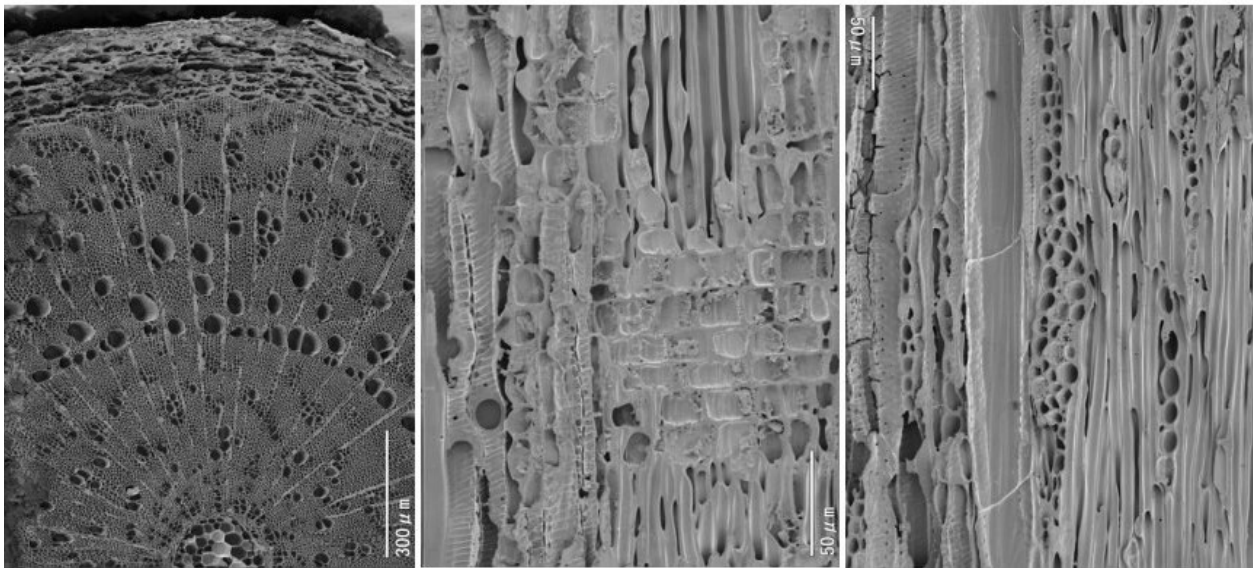


transverse section
поперечный разрез
кўндаланг кесими



enlarged center
увеличенный центр
катталаштирилган маркази

Figure 8d. No. 13-3. monocotyledonous plant
Рис. 8d. № 13-3. однодольное растение
8д-расм. № 13-3. бир паллали ўсимлик



transverse sections
поперечный
кўндаланг

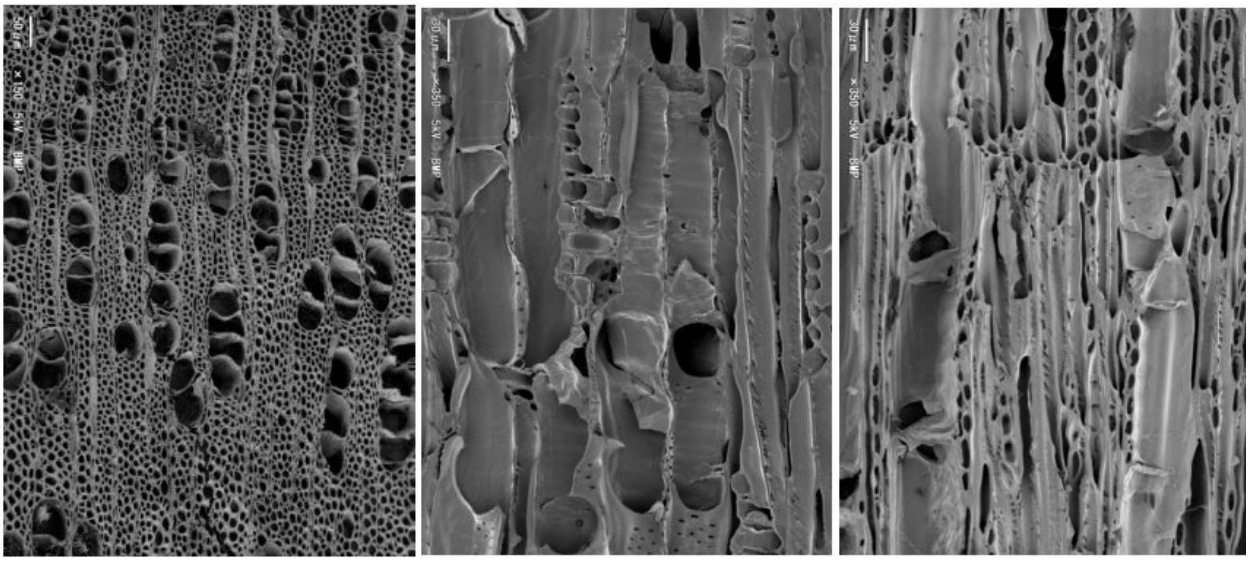
traight grain section
прямой разрезы
тўғри кесмалари

plank surface
поверхность планок
юзаси

Figure 8e. No.13-4. Sumac – Rhus

Рис. 8е. №13-4. Сумах – Rhus

8е-расм. № 13-4. Сумах — Рхус



transverse sections
поперечный
кўндаланг

traight grain section
прямой разрезы
тўғри кесмалари

plank surface
поверхность планок
юзаси

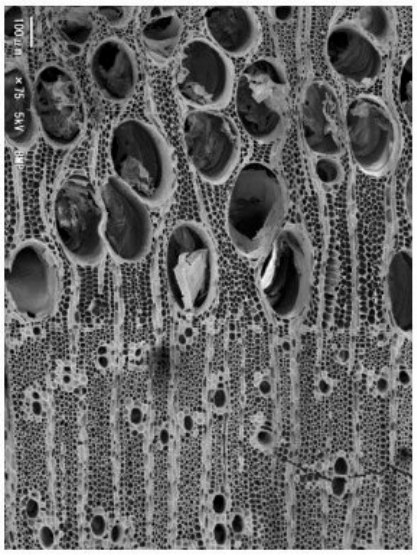
Figure 9a. No.10. Populus

Рис. 9а. №10. Тополь

9а-расм. Терак

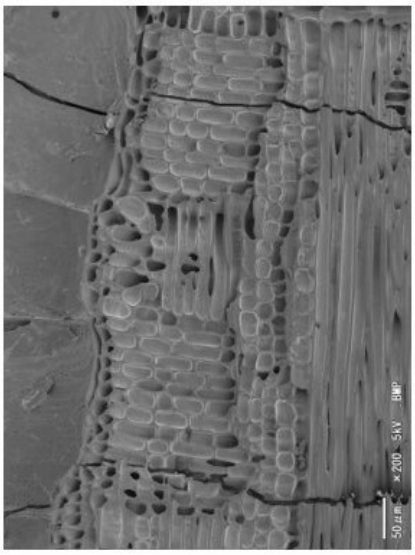
The samples, characterized by their frame-like solid forms, are generally grouped together in this section. These have been potentially utilized for furniture, including fixtures to support boards or other carvings. Among these, sample № 11, identified as willow (*Salix*), was unearthed in the form of a frame on the floor alongside a nearby panel featuring a horse motif.

Additional samples, namely № 14, 15, and 16, exhibit a relatively thick profile, indicating potential application as construction materials or fixtures for larger objects. Sample № 15 was excavated from beneath sample № 14. It might have served the leg for a sizeable piece of furniture or another object. This sample is identified as diffuse-porous wood with features resembling *Rosaceae*. In the vicinity, cylindrical wooden objects with arabesque carvings, which could be components of furniture or the like, were excavated.



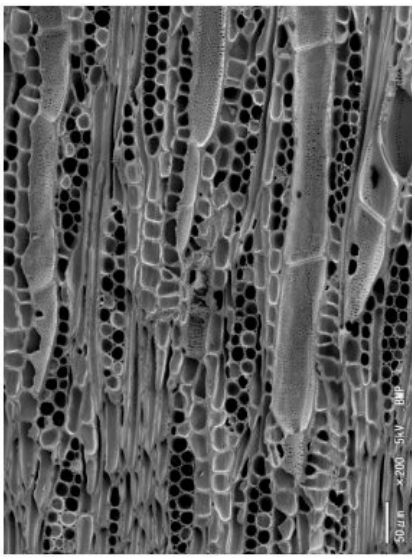
transverse sections
поперечный
кўндаланг

Figure 9b. No.8. Ash tree



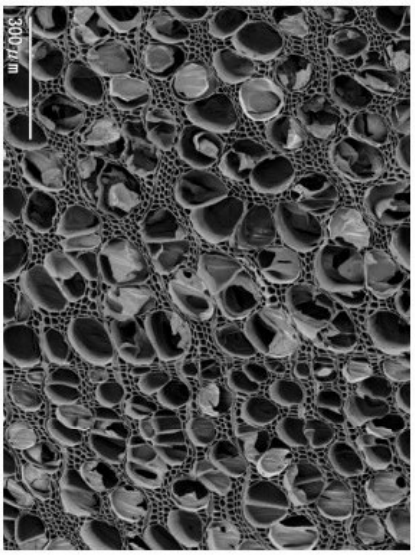
traight grain section
прямой разрезы
тўғри кесмалари

Рис. 9b. № 8. Ясень - fraxinus



plank surface
поверхность планок
юзаси

9б-расм. № 8. Шумтол



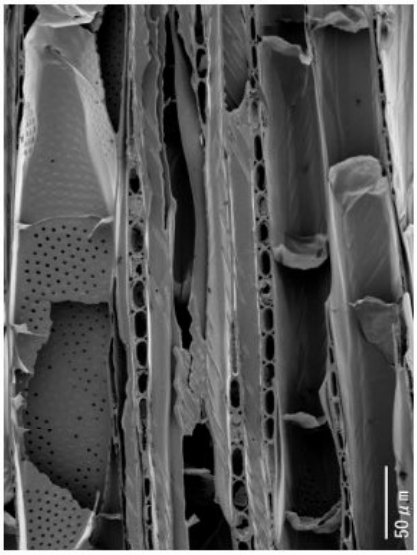
transverse sections
поперечный
кўндаланг

Figure 9c. No.11 Willow



traight grain section
прямой разрезы
тўғри кесмалари

Рис. 9c. № 11 Ива



plank surface
поверхность планок
юзаси

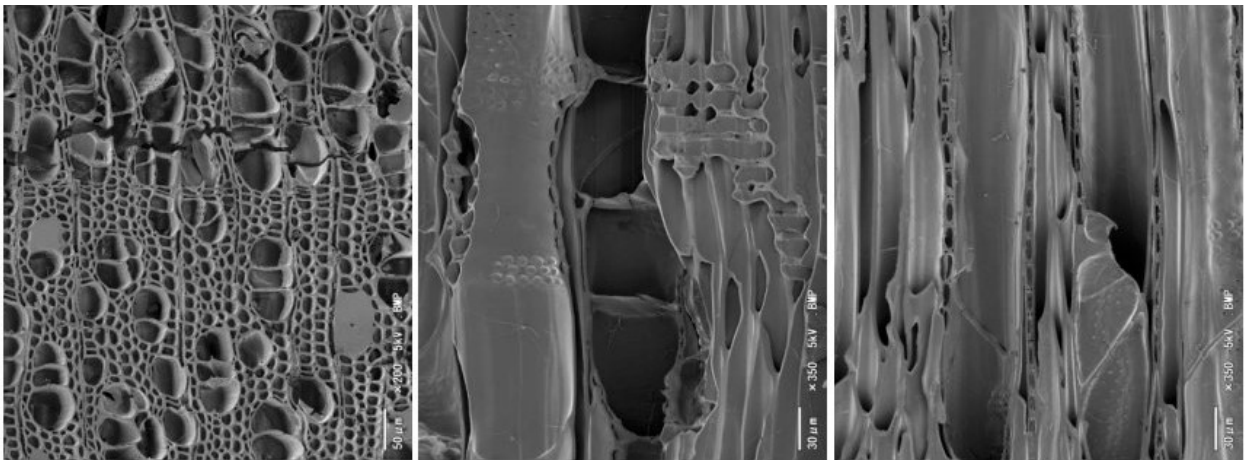
9c-расм. № 11 Мажнунтол

Finally, sample № 8, identified as *Fraxinus Oleaceae* or ash, is generally known for its toughness, resilience but also for elasticity and easiness of processing. Although its shape could not be confirmed, it seems another plausible candidate for use in furniture-making, not excluding other possibilities.

8) Wood materials whose purpose of application is unknown Sample №: 6, 7, 9, Fig. 10.

Identification: *Populus* location of excavation: Room 15/16

The purposes of these samples remain unidentified based on their morphology and the circumstances surrounding their excavations. Samples № 6, 7, and 8 were excavated in the vicinity of a *sufa* positioned along the eastern wall of Room 15/16. Sample № 6 is a square piece of wood measuring 4.5 cm on each side, and № 7 is a square piece of wood measuring 3 cm on each side. The original shapes of samples № 8 and № 9 could not be restored. Samples № 6, 7 and 9 were all made from *Populus*.



transverse sections
поперечный
кўндаланг

traight grain section
прямой разрезы
тўғри кесмалари

plank surface
поверхность планок
юзаси

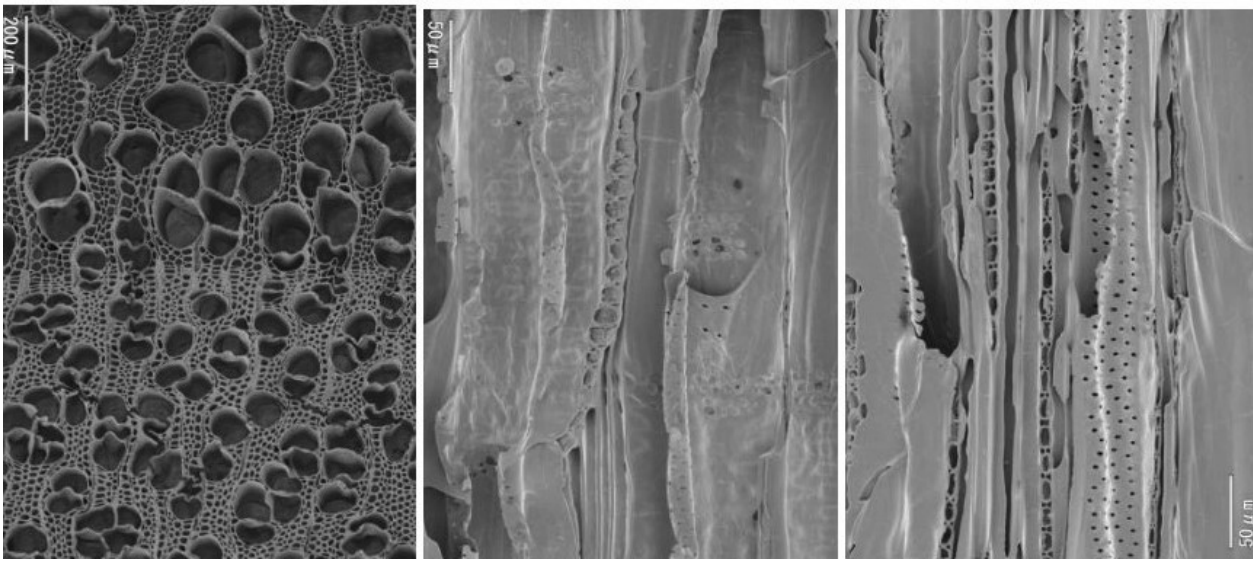
Figure 9d. No.14. Populus

Рис. 9d. №14. Тополь

9д-расм. №14. Терак



Figure 9e. Room 15/16: Timber discoveries on the floor. Samples Nos 15 and 16.
Рис. 9e. Помещение 15/16: деревянные находки на полу. Образцы №№ 15 и 16.
9е-расм. 15/16-хона полидаги ёғоч топилмалар. № 15 ва 16 намуналари

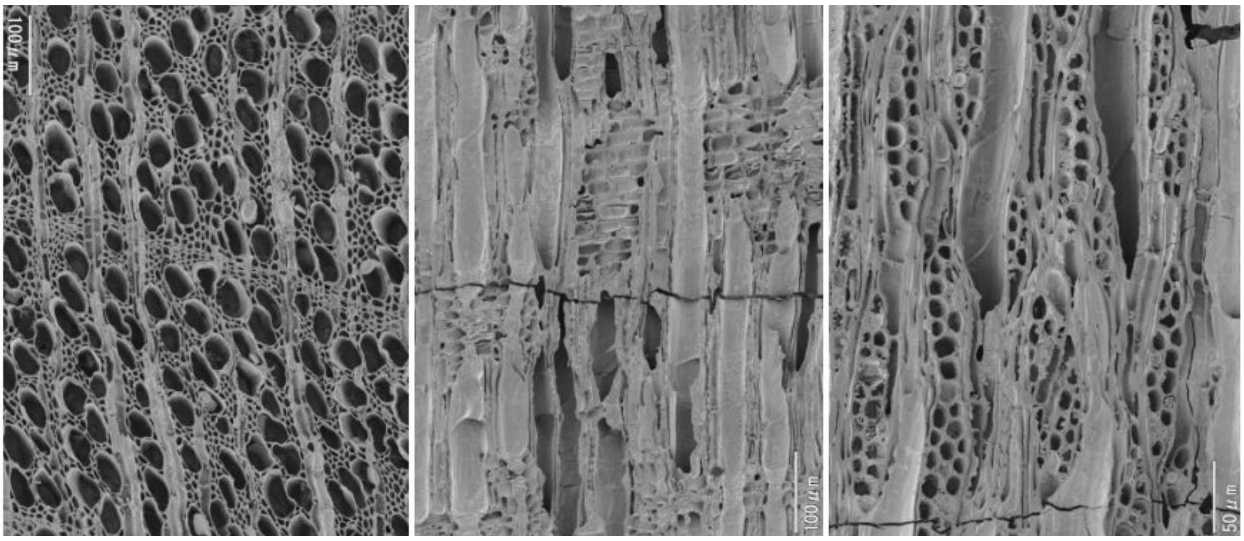


transverse sections
поперечный
кўндаланг

straight grain section
прямой разрезы
тўғри кесмалари

plank surface
поверхность планок
юзаси

Fig. 9e. No.15. Populus *Рис. 9е. №15. Тополь* *9е-расм. №15. Терак*



transverse section
поперечный
кўндаланг

straight grain section
прямой разрезы
тўғри кесмалари

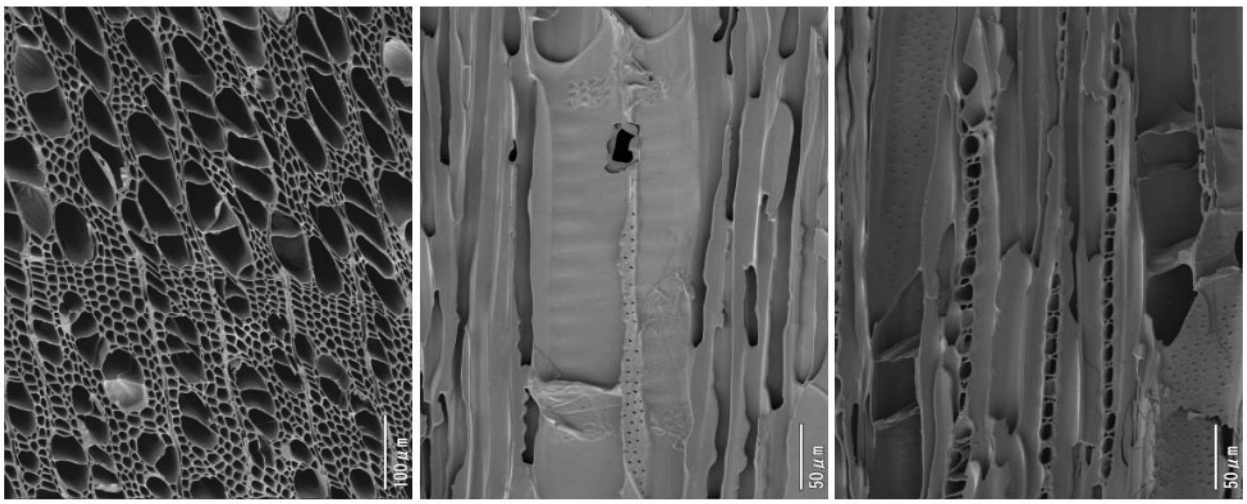
plank surface
поверхность планок
юзаси

Fig. 9e. No.16. Diffuse-porous wood *Рис. 9д. № 16. Диффузно-пористая древесина* *9е-расм. № 16. Диффуз говакли ёғоч*

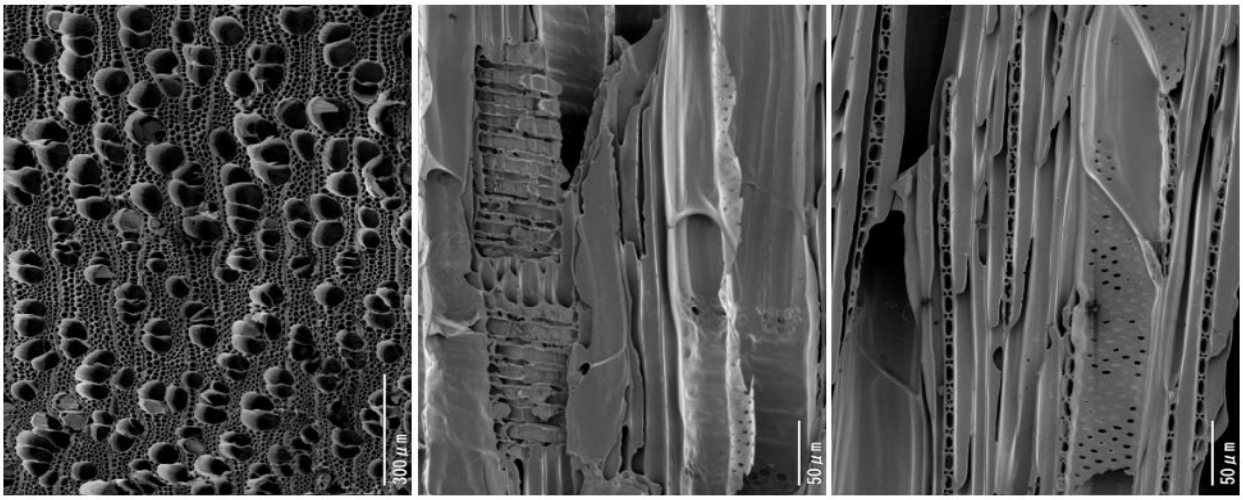
6. Conclusion

The results of our efforts to identify the types of timber and flora excavated primarily at the citadel of Kafir-kala revealed five different tree species – poplar (*Populus*), willow (*Salix*), ash (*Fraxinus*), sumac (*Rhus*), and diffuse porous wood (*Rosaceae*), along with other plant species such as monocotyledonous plants. Notably, poplar emerged as a frequent choice for building material, and its application appears to have extended to the field of carving art, likely due to its ease of fashioning into large panels and carving-friendly nature. The wooden panels depicting the goddess Nana and her worshippers from Room 15/16 were also crafted from poplar.

Examining the wood and plant material acquired from the groove within the central staircase in Room 15/16, led to the assumption of their potential use as offering and incense, prompting consideration of the likelihood of this space functioning as an altar-chapel. This, in turn, allowed



No.6. Populus: transverse section straight grain section plank surface



No.7. Populus: transverse section straight grain section plank surface

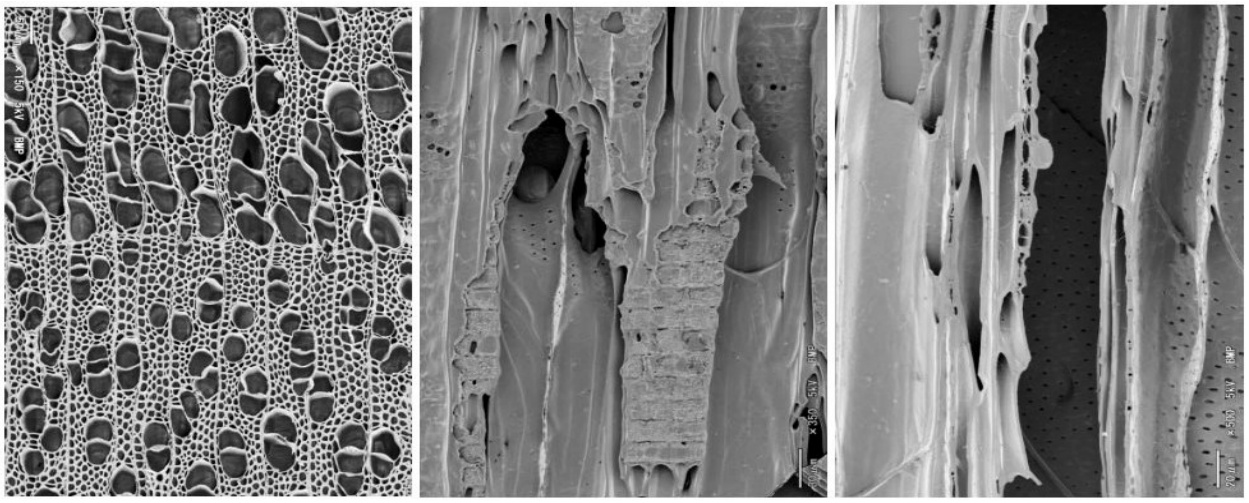


Figure 9e. No.16. Diffuse-porous wood: transverse section straight grain section plank surface
Figure 9a-e. Timber samples Nos. 8, 10, 11, 14, 15, 16 potentially utilized for furniture manufacture.
Рис. 9а-е. Образцы древесины №№ 8, 10, 11, 14, 15, 16 вероятно используемые для изготовления мебели и подобных изделей.
9а-е расм. Эҳтимол мебель ва шунга ўхшаш маҳсулотларни тайёрлаш учун ишлатилган ёғоч намуналари (№ 8, 10, 11, 14, 15, 16)

speculation that the complex at the citadel may have housed ceremonial gatherings, including primarily those associated with the goddess Nana.

On the other hand, objects presumed to be furniture or the like, and a basket involved the application of willow. The use of poplar as a construction material, the utilization of monocotyledonous plants for thatching roofs, and the application of willow in woven objects persist to this day in Uzbekistan and other parts of Central Asia. This continuity reflects the enduring significance of these materials in the region's cultural and practical traditions.

The discovery of several wooden containers at the citadel of Kafir-kala in 2019, will be addressed in the future study. Ongoing excavations in the *shahristan* area have also yielded numerous wood and plant materials. Through further analyses of these containers, and the newly discovered objects, we aim to find out the differences between the timber and flora obtained at the citadel and *shahristan* areas.

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Notes:

[1] In rural areas of Uzbekistan, there is reportedly a custom of planting a poplar in the garden when a son is born. When the son marries, the tree is felled and used as building material for a new house, highlighting the versatility and significance of *Populus* as a construction material in the region.

[2] In contemporary Uzbekistan, a dried medicinal grass called *isiriq (adrasmon or hazori respon)* is burned, and the resulting smoke is utilized to disinfect rooms. It is also believed to be effective in treating sore throats associated with colds and other illnesses when people walk through the smoke. Additionally, *isiriq* is also commonly placed at doorways and in rooms as a talisman believed to ward off evil. In Kyrgyzstan, the smoke produced by burning pine needles is thought to exorcise the devil and purify spaces.

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ДРЕВЕСИНА И ФЛОРА ИЗ КАФИРКАЛЫ В САМАРКАНДЕ: РАСКРЫТИЕ ИХ ВИДОВ И ПРАКТИЧЕСКОЕ ПРИМЕНЕНИЕ

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Ключевые слова: Согд, Кафиркала, панно, дерево, растительные остатки.

Данная статья посвящена идентификации видов и применения деревянных и растительных остатков, найденных в доисламских слоях в процессе раскопок дворцово-монументального комплекса на цитадели Кафиркалы узбекско-японской экспедицией. Результаты исследования показали наличие пяти различных видов древесины: тополя (*populus; salicaceae*), ивы (*salix; salicaceae*), ясеня (*fraxinus; oleaceae*), сумаха (*rhus; anacardiaceae*), а также рассеянно-пористой древесины (*rosaceae?*) и других растительных остатков. Среди древесины наиболее часто использовался тополь (*populus; salicaceae*). Применение тополя проявилось и в изготовлении деревянных панелей с изображением богини Наны и согдийцев, совершающих поклонение богине, из центральной комнаты цитадели (помещение 15/16). Остатки различных древесных палочек и растений, а также другие находки, обнаруженные в щели, представлявшей собой шов между основной частью центральной суфы и нижней приступкой, наводят на мысль о назначении этого помещения как алтаря-часовни, посвященного богине Нане. Это позволяет предположить связь комплекса цитадели с ритуальными церемониями, в том числе молитвами и праздниками, посвященными этому божеству. Не исключено, что в этом монументальном комплексе проходили и другие собрания, связанные с политическими и различными событиями.