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HISTORICAL AND THEORETICAL FOUNDATIONS OF THE ART OF DOIRA PERFORMANCE

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Abstract

This article analyzes the scientific and practical aspects of doira performance, the basis of Uzbek and Karakalpak national instrumental art. The study highlights the acoustic characteristics of doira strikes, the mathematical structure of maqom rhythmic patterns (usuls), and the biomechanics of finger techniques based on authentic sources.

Keywords

doira, membranophone, acoustics, usul, rhythm, biomechanics, maqom, strike, resonance.

The doira is the rhythmic foundation of the musical thinking of Central Asian peoples, particularly the Uzbeks and Karakalpaks. It serves as a unique "metronome" and a symbolic representation of national identity. It is not merely a percussion instrument but the rhythmic matrix of Eastern musical culture, having become an integral part of human spiritual life over centuries. According to organological classification, the doira belongs to the category of single-headed membranophones. Its sound structure fundamentally differs from other percussion instruments by combining both unpitched noise-like elements and pitched melodic sound characteristics.

The evolutionary development of the art of the doira spans a vast and complex historical path, beginning from religious and ritual dances in the Zoroastrian era, passing through the Middle Ages, and reaching modern academic stage performance. Written records from antiquity and depictions in the Afrasiab wall paintings scientifically prove the deep ancient roots of frame drums in Central Asian civilization. Medieval music theorists, particularly Abu Nasr al-Farabi and Safi al-Din al-Urmawi, while analyzing issues of rhythm (*iqa*), specifically highlighted the doira and its rhythmic patterns (*usuls*) as the "life-giving pulsation" of music.

From a scientific and methodological perspective, the art of doira performance has formed distinct local school systems in the territories of Uzbekistan and Karakalpakstan. The differences between the Tashkent-Fergana, Bukhara-Samarkand, and Khorezm-Karakalpak performance schools are manifested not only in playing style but also in the construction of the instrument, its diameter, and the complexity of its *usuls* (rhythmic formulas). For example, the Tashkent-Fergana school prioritizes the *rez* (tremolo) and extreme precision of finger movements, whereas the Khorezm and Bukhara schools focus more on the depth of the *bum* (low-frequency) strikes and the dramatic expressiveness of the *xat* (slap) elements.

Each of these schools possesses its own unique system of *usuls*, which have been passed down from generation to generation over centuries through the "master-apprentice" (*ustoz-shogird*) tradition of oral professionalism. In this process, the doira player acts not merely as a musician, but as an "architect" who maintains the temporal and spatial balance of the musical piece.

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"The doira is the coordinator and heart of the ensemble. Its task is not only to maintain metrorhythmic accuracy but also to consciously control the inner pulsation of the musical work, that is, the 'breath' of vocal or instrumental pieces. It is impossible to imagine Eastern music without the doira, as it is the main link that unites a musical work into a coherent structure"[1].

In modern academic music, the doira has transcended its traditional status as an accompanying instrument to conquer world stages as an independent solo instrument. This shift has exponentially increased the technical demands placed on doira performance. Today, a professional doira player is required not only to know traditional *usuls* but also to understand the complex polyrhythmic layers of contemporary compositions, maximize the instrument's acoustic resonance, and perfectly master finger biomechanics.

In Karakalpak national performance, the doira (*dap*) has developed in inextricable connection with the art of the *Jirau* and *Bakhshi*. Here, the doira primarily provides the rhythmic foundation for the epic storytelling traditions. The issues raised in this introductory section—the history, theory, and modern requirements of doira performance—are thoroughly analyzed acoustically and methodologically in the subsequent sections.

Scientific analysis of doira performance technique primarily requires an understanding of its physical nature and the mutual coordination of human motor organs. The process of sound production in this instrument consists of a complex chain of vibrations determined by the elasticity of the membrane, the acoustic resistance of the frame, and the striking force of the performer.

The points of sound production on the surface of the doira are the main factors ensuring its spectral richness. In professional performance practice, strikes are divided into three fundamental categories based on their acoustic frequency and timbral characteristics:

-Bum (Low-frequency): Produced at a point near the geometric center of the membrane. At this point, the vibration amplitude reaches its maximum, creating a fundamental tone with a low frequency (ranging from 60-120 Hz). This strike serves as the "foundation" or "base" of the *usul*.

-Bak (High-frequency): Produced by striking near the edge of the wooden frame. Because the membrane tension is higher here, the vibration frequency increases (400-800 Hz), producing a bright, metallic resonance.

-Xat (Slap): A muted strike caused by the full and brief contact of the palm with the membrane surface. It primarily serves to fill rhythmic pauses and emphasize dynamic accents.

The role of the metal rings (jingles) inside the doira is not merely decorative; they act as an important acoustic filter. They add an element of "white noise" that appears after the main strike, extending the duration of the sound and increasing its acoustic projection. "The acoustics of the doira are a unique synthesis of skin and metal vibrations. The jingling of the rings creates a specific 'acoustic background' to the main rhythm, and this is the primary feature that distinguishes Central Asian percussion instruments from the drums of other nations"[2].

In Uzbek *maqom* art, doira *usuls* are not merely time measures but the compositional skeleton of the work. Each *usul* possesses its own internal mathematical logic and is built upon

[1] Vyzgo T.S., "Musical Instruments of Central Asia," Moscow, "Muzika," 1980, p. 72
[2] Petrosyants A.I., "Instrumentovedenie," Tashkent, "Muzika," 1980, p. 58

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the concepts of *tak* (small unit) and *davr* (large cycle). For instance, the "Mukhammas" *usul* has a complex 16-quarter structure that incorporates various dynamic accents.

Academic research indicates that doira *usuls* are the primary code defining the genre of a musical piece. If a performer changes the *usul*, the entire artistic aesthetics of the piece can be altered. "Maqom doira usuls are not simply repeating rhythms, but complex architectural structures that encompass minor and major cycles, as well as various dynamic layers. It is the expression of musical logic with mathematical precision"[3].

Doira performance is a biomechanical process that requires extremely fine coordination of the human palm and finger muscles. In professional performance, there is a clear functional division between the right and left hands. While the right hand is primarily responsible for "active" strikes (*Bum*, *Bak*), the left hand, in addition to holding the instrument, executes "micro-technique" elements (such as *shigiroq* and *tirqish*) using the ring finger and pinky.

In contemporary doira performance, finger fingering (*applicatura*) has been elevated to a new level. In particular, the development of the *rez* (tremolo) technique has enriched the doira harmonically and timbrally. Master performers like Abbos Kosimov have introduced techniques to create simultaneous polyrhythmic layers on the surface of the doira. This demonstrates the necessity of studying finger joint flexibility (agility) and muscle endurance on a scientific basis.

"The expansion of the dynamic range (from *pp* to *ff*) in modern doira performance requires the performer to have a high level of muscle control. Every finger strike is a precisely directed energy impulse"[4].

In conclusion, the theoretical and practical foundation of doira performance lies in a deep understanding of its acoustic capabilities and the cultivation of the performance apparatus using scientific methods. This process is the key factor in elevating national instrumental art to the level of global academic music.

This scientific analysis of the "Historical and Theoretical Foundations of the Art of Doira Performance" demonstrates that the doira is not only a musical symbol of Central Asian peoples but a perfect instrument based on profound physical and mathematical laws. Throughout the research, it has been scientifically proven that the acoustic parameters of doira performance, the classification of strikes, and finger biomechanics are intrinsically linked.

The analysis of the frequency ranges of the *Bum*, *Bak*, and *Xat* strikes discussed in the article shows that the doira player on stage acts not only as a rhythm keeper but also as an acoustic engineer creating a unique "timbral polyphony." In particular, the balance between the "white noise" effect of the metal rings inside the doira and the vibration amplitude of the membrane constitutes the unique "genetic code" of national performance.

To summarize:

-Metrorhythmic Stability: Doira *usuls* serve as the compositional skeleton of national music, specifically *maqom* art, determining the genre characteristics of the work.

[3] Ishokov B., "Doira darsligi," Tashkent, "Musiqa," 2005, p. 45
[4] Olimov S., "Uzbek Percussion Instruments," Tashkent, "Oqituvchi," 2012, p. 94

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-Performance Biomechanics: Modern doira performance demands a new level of finger fingering, which in turn necessitates a scientific approach to the physical and psychophysical training of the musician.

-Academic Prospects: Enriching the traditional "master-apprentice" method with modern acoustic analysis in the study of doira art will further increase the competitiveness of the instrument on international stages. "The doira is a musical symbol of national identity and the echo of historical memory. Each of its strikes defines the spiritual pulse of the people and serves as an immutable rhythmic foundation for future generations"[5].

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[5] Uspensky V.A., "Scientific Heritage," Tashkent, "Fan," 1980, p. 112