

Anthropological study of five skeletons from a pit sanctuary near the village of Malko Tranovo, Chirpan municipality (late 12th-11th centuries BCE)

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The objective of this study is to conduct a comprehensive anthropological analysis of four human skeletons discovered in proximity to a pit sanctuary near the village of Malko Tranovo, dated to the Early Bronze Age (12th–11th centuries BCE).

Osteometric measurements were obtained following the methodologies established by Martin and Saller, Y. Yordanov, and Alekseev and Debetz.

A total of five skeletons were unearthed from four burial pits. Two individuals were interred in the first pit, probably a woman and a child, while the remaining three were found singly in separate pits. The first three burial features are situated in close proximity to one another, whereas the fourth is located approximately 50 meters to the east. All burials are primary in nature.

Stature estimations were derived from the lengths of the long bones of the limbs using the regression formulae proposed by Pearson, Trotter and Gleser, and Steele.

Key words: Anthropological data, Thracian, pit, sanctuary, Iron Age, Malko Tranovo, Kozluka

Introduction

The 2004 excavations in the Kozluka area along the Trakia highway uncovered a multi-period ritual complex centered on a pit sanctuary, primarily active between the 5th and early 4th centuries BC [2, 6]. The diverse burial practices, ceramic assemblages, and stratigraphic data reveal intricate ritual behaviors, elements of ancestor worship, and evidence of long-term site continuity from the Early Iron Age to the Roman period. These findings provide new insights into Thracian funerary traditions, socio-religious structures, and cultural interactions within the Upper Thracian Lowland during the 1st millennium BC.

Materials and Methods

The archeological studies were conducted in May–June and August–September 2004 by a team led by Prof. A. Bozhkova (NAIM) and lasted three months. The site is in the Kozluka area [2,3,4,6,7,8], on a northeastern slope above a semi-dry ravine between km 188+760 and 189+140 of the Trakia highway route. It is a pit sanctuary with over 270 studied facilities, of which 168 were studied in 2004 with different sizes - from shallow excavations to deep pits with a length of 7 m and a depth of 2.2 m. They date back to the Early Bronze Age, Early Iron Age, Classical, Roman and undetermined eras, with most belonging to the 5th - early 4th centuries BCE. Some are multi-part, without a strict arrangement, but with partial planning and grouping by periods. Their openings are disturbed by agricultural activity and appear as dark spots in the sterile layer. The shapes vary – round, elliptical, rectangular and irregular, with dimensions from 0.60×0.80 to 2.10×7.20 m.

The pits are hemispherical, conical, beehive-shaped, bell-shaped or vessel-shaped, often asymmetrical, with the cylindrical ones being characteristic of the Early Iron Age, and the vessel-shaped ones – of the Classical Age. The filling contains dark soil with stones, charcoal, ash, plaster, animal bones and ceramics. Some facilities stand out – pit № 106 is probably a ditch from the Early Iron Age, and № 128 contains the remains of a furnace. Among the finds are ceramics, clay figurines and idols from the Early Iron Age, and from the Classical Age – hand- and wheel-made vessels, local and imported Greek ceramics (black-fired and painted vessels, amphorae from Chios, Lesbos, Thassos, Mende, etc.), as well as cult objects, a stone figure of a horse, vertebrae, tokens, bronze ornaments and iron knives. Fragments of coarse kitchen and table ceramics have been found from the Roman era [2, 3].

Each of the graves was assessed according to several indicators: 1. Assessment of the burial; 2. Type of burial; 3. Position of the bones in the pit; 4. Species belonging of the bones; 4. Condition of the bones [5].

Osteometric measurements were obtained following the methodologies established by Martin and Saller, Y. Yordanov, and Alekseev and Debetz [1, 5, 10]. Stature estimations were derived from the lengths of the long bones of the limbs using the regression formulae proposed by Pearson, Trotter and Gleser, and Steele [11, 12, 15].

Results and Discussion

In the area near the village of Malko Tranovo, near the town of Chirpan, 4 grave pits were discovered. The first three are in close proximity to each other (in the eastern half of the easement) with the same orientation, and the fourth is about 50 meters away in an easterly direction [2]. The graves are rectangular pits dug into the mainland with rounded corners and dimensions: length between 2.40–3.00 m and width from 0.60 to 1.00 m.

In grave pit № 1, two human skeletons were discovered, in the remaining three grave pits - one each. A total of five human skeletons. In grave № 3, the northernmost of the group, a grave inventory was discovered: a complete vessel – a cup with one handle, dating from the Early Iron Age (**Fig. 1**)



Fig. 1. General view of the three graves before the excavation of the skeletal remains

Grave № 1 – Two skeletons were discovered in grave pit № 1. The first, № 1, is of an adult individual, and the second, № 2, is of a younger individual. Based on the specific arrangement of the discovered bones, it can be stated that the two individuals were laid with their heads and feet towards each other (a “valve” type position) (**Fig. 2**).

The burial is primary (the bones are in anatomical order). The burial is on the back, in a stretched position. The skeletons are one on top of the other - № 1 is with its head to the south, and the skeleton № 2 is with its head to the north. The burial is double, the bones are human, significantly damaged secondarily, without traces of burning.

The location of the Burial facility № 1 is in North – South direction. The dimensions are: Length – 240 cm, width 50 – 55 cm, depth 5-10 cm.

It is a rectangular burial pit, dug into the mainland terrain, without additional shaping. The pit is strongly elongated along the N/S axis with rounded corners. The preserved depth of the burial pit is 5 –10 cm, since the burial facility was affected by agricultural activities. The bottom is relatively flat, made of sterile mainland soil [2]. The pit is filled with black, strongly compacted clay soil, individual spots of brown compacted clay, lumps of mainland and charcoal. When clearing the skeleton, several small, uncharacteristic fragments of ceramics were found that fell into the burial pit.

Skeleton № 1 – Total length of skeleton № 1 is about 160 cm [1,5,10]. Situated in Supine position. The orientation is as follows: Longitudinal axis head-feet is south-north. Skull turned towards right shoulder (facing east).



Fig. 2. Skeleton № 1 & № 2 (Grave pit № 1)

Characteristics of the bones

Skull: Highly fragmented. Almost the entire left half of the skull is missing. Preserved parts of individual bones – upper jaw, left eye socket, right temporal bone, occipital bone.

Maximum Cranial Length (g-op distance) is 20 cm. The bones of the skull are of a smaller thickness than the average – about 3-4 mm.

Bones of the trunk: Bones of the chest, spine and ribs are not preserved. Partially preserved pelvic bones.

Bones of the limbs: Preserved: Upper limb: 1. Left humerus with a length of 26 cm. 2. Left ulna – 21 cm. Single carpal and metacarpal bones were found.

Lower limb: 1. Right femur – 34 cm. 2. Right tibia – 33 cm. The remaining bones are fragmented, relatively preserved. They do not allow for accurate measurement. Single bones of both feet were found.

This was a skeleton buried in a supine position, with parallel lower limbs. Head turned towards the right shoulder; upper limbs strongly flexed at the elbow joints (right more than left) with forearms crossed in front of the chest and hands towards the head. Due to the unnatural flexion at the elbow joints, it is assumed that the upper limbs were tied distally (around the wrists or the palms of the hands) to hold them in the described position. The hands were clenched into fists, which is evident from the typical spatial relationship between the preserved metacarpal bones and the phalanges of the fingers. The right hand is higher than the left and touched the left shoulder. The wings of the two hip bones are relatively preserved, visible about 3 cm above the ground. They are quite low and spread, as in a female pelvis.

When determining the height based on the preserved long bones, it was found:

Femur – 141.82 cm, Humerus – 149.78 cm, Tibia – 155.09 cm, Average value – 149 cm [1,5,10]. It should be noted that preserved lengths of the long bones were used, which suggests that the height is significantly greater.

Skeleton № 2 – In the same grave pit, another skeleton was discovered – skeletal remains of younger individual, lying over skeleton №1. Total length of the skeleton – about 60cm, supine position, with orientation head to north, feet to south, missing bones of the skull.

Characteristic of the bones:

Skull: A single fragment of flat skull bone was lying between the femoral bones of skeleton №1.

Bones of the postcranial skeleton: Bones of the postcranial skeleton are extremely poorly preserved in very poor condition. Most of the bones of the upper part of the skeleton are missing. Fragments of pelvic bones were found.

Limb bones: Preserved: Upper limb: 1. Humerus with a preserved length of 10 cm.

Lower limb: 1. Left femur – 40 cm. 2. Right tibia – 34 cm [1, 5, 10]. A fragment of a calcaneal bone was found.

This is a skeleton buried in a supine position, with a straight left lower limb and a slightly abducted right, bent about 15° at the knee.

The head is probably at the feet of skeleton № 1. There are no bones from the upper part of the skeleton that would indicate the position of the body. The discovered fragment of the humerus is at the right knee of skeleton № 1, which suggests that the fragment is from the right humerus, assuming that the individual was buried on his back. The specific arrangement of the parts of the bones from the left pelvic half, which were found on the femur of skeleton № 1, also suggests a supine position.

Unfortunately, the bone material is in very poor condition and the sex of the buried individual cannot be determined with certainty. A very approximate determination of height can only be made from the preserved femur from the Trotter-Gleser formula, namely approximately 158 cm [15].

The molars and canines from the deciduous dentition revealed deep hypoplastic defects on the occlusal surface which resembles a disease state caused by an infectious agent during the 2nd trimester of pregnancy [9]. It is assumed that the buried individual was between 8 and 12 years old, i.e. infants II.

Grave № 2 – It is located immediately to the east and parallel to grave № 1. The two graves are 0.40 m apart. The grave pit appears to be intermediate (between № 1 and № 3) in location and depth. A skeleton of 1 adult individual was discovered in grave pit № 2.

The burial is primary (the bones are in anatomical order). The burial is sideways in a crouched position resembling a Hocker, with the head to the south. The burial is single; the bone remains are human. The bones are relatively well preserved, without traces of burning and other manipulations and rituals.

Burial facility № 2 is located in the North-South direction. The dimensions are as follows: Length at the opening - 260 cm and at the bottom 240 cm, width at the head 104 cm, and at the feet 85 cm. The depth of the burial pit from the level of the terrain from which it is fixed is 30 cm (**Fig. 3**).

The burial pit has no additional design; it is dug into the mainland soil. Its corners are rounded, which is why it has an approximately elliptical shape, slightly expanding to the south. The pit is filled with dark brown to black soil, strongly compacted. Small charcoal, fragments of plaster and single uncharacteristic fragments of ceramics were found in the soil from the pit [2, 3].



Fig. 3. Skeleton № 3 (Grave pit № 2)

Skeleton № 3 – total length about 160 cm, right-side position, longitudinal axis – head-feet is south-north. Skull turned to the right shoulder face to the east

Characteristics of the bones

Skull: Relatively well-preserved cranial bones, slightly fragmented in place by the pressure of the soil. The height of the skull – 22 cm. The forehead is low, strongly sloping. Well-developed occipital relief. The existing teeth have abrasio III – IV degree. Last molars (wisdom teeth) are missing.

Bones of the postcranial skeleton: Bones from the chest and spine are preserved. Single ribs were found. Well-preserved pelvic bones.

Limb bones: Preserved: Upper limb: 1. Left humerus, 29.5 cm long. 2. Left ulna (fragment) – 23 cm. Single carpal and metacarpal bones were found.

Lower limb: 1. Left femur – 40 cm. 2. Right tibia – 36 cm.

The remaining bones are fragmented and less well preserved. Single bones from both feet were found, most of them from the left.

This is a skeleton of an individual buried in a lateral position to the right with the head turned towards the right shoulder. The position of the body is slightly bent at the expense of the cervical spine and the hip and knee joints, while the rest of the spinal column is upright. The lumbar and thoracic vertebrae are in a position of moderate right rotation. The position resembles the embryonic one. The upper limbs are strongly flexed at the elbow joints, with the forearms crossed in front of the chest and the hands towards the head. The left humerus is parallel to the body. Due to the unnatural flexion at the elbow joints, it is assumed that the upper limbs were tied distally (around the wrists or the

palms folded) to hold them in the described position. The hands were clenched into fists, which is evident from the typical spatial relationship between the preserved metacarpal bones and the phalanges of the fingers. The right hand is higher than the left, both below the chin. A deformation of one of the metacarpal bones of the right hand was found.

The lower limbs are parallel, probably one on top of the other (left on right), but when the earth settled they shifted. From the position of the bones of the lower limbs, it can be said that the hip joints are in a position of about 40° ante flexion; the knee joints – about 30° flexion, and the ankle joints - about 30° extension.

The bones of the left pelvic half are above the ground, while the right are dug in. The pelvic wings are like those of a male pelvis. The preserved bones have a strongly developed relief.

When determining the height based on the preserved long bones, it was found:

Femur – 159.98 cm, Tibia – 172.71 cm, Humerus – 165.36 cm. Average value – 166 cm.

The buried individual is probably a man of mature age – about 35 – 40 years old.

Grave № 3 – It is located immediately east and parallel to graves № 1 and № 2.

It is 30 – 40 cm from grave № 2. In grave pit № 3, a skeleton of 1 adult individual was discovered.

The burial is primary (the bones are in anatomical order). The burial is sideways in a crouched position resembling a Hocker, with the head to the south. The burial is single; the bone remains are human. The bones are relatively well preserved, without traces of burning and other manipulations and rituals.

Burial facility № 3 is located in the North-South direction.

The dimensions are as follows: Length at the opening – 307 cm and at the bottom 275 cm, width at the head 78 cm, and at the feet 62 cm. The depth of the grave pit at the head is 30 cm, and at the feet – 40 cm. It is an ordinary grave pit dug into the mainland terrain. The pit has a strongly elongated and slightly trapezoidal shape. The corners of the pit are slightly rounded. The two long walls of the pit curve in an arc to the E. The bottom is uneven with a slope to the S of mainland soil. The grave pit is filled with an inhomogeneous layer of dark brown to black in color, strongly compacted soil, lumps of mainland. In the soil around the skeleton, individual charcoals, lumps of burnt clay, plaster and few uncharacteristic fragments of ceramics are observed. Behind the back of the skull, a ceramic cup with one handle, flutes and loops, made by hand, was discovered [4,14].



Fig. 4. Skeleton № 4 (Grave pit № 3)

Skeleton № 4 – total length about 150cm, supine to right-side position, longitudinal axis – head feet is south-north. Skull turned to the right shoulder face to the east.

Characteristics of the bones

Skull: Fragmented skull bones. Relatively preserved in place. Greater than average thickness – about 6-7 mm. Skull height – 20 cm.

The preserved teeth are long, large – with a large root and high crowns. Abrasion – II to III degree.

Bones of the postcranial skeleton: Bones from the chest and spine are preserved. Single ribs were found. Well-preserved pelvic bones.

Limb bones: Preserved : Upper limb: 1. Left humerus with a length of 28 cm. 2. Left ulna (fragment) – 26 cm. Single carpal and precarpal bones were found.

Lower limb: 1. Left femur – 41 cm. 2. Right femur – 39 cm 3. Right tibia – 40 cm. The remaining bones are fragmented and less well preserved. Single bones from both feet were found. The forefoot bones on the left are severely deformed, both talar bones are preserved. The bones are relatively gracile, with good relief.

This is a skeleton of an individual buried in a dorsal-lateral position to the right with the head turned towards the right shoulder. Fragments of ribs were found. The lumbar vertebrae and part of the thoracic vertebrae are missing. The upper limbs are strongly flexed at the elbow joints, with the forearms crossed in front of the chest and the hands towards the head. The left humerus is in an anteverted position of about 90°. Flexion in the left elbow at the time of burial was complete, although the bones of the forearm are not quite parallel to the humerus. This is not a discrepancy in position, since in living individuals the factor that limits flexion in the elbow is the soft tissues on the front side of the arm. The bones of the left hand are located under the left ramus of the lower jaw and. Due to the unnatural flexion in the elbow joints, it is assumed that the upper limbs were tied distally (around the wrists or the folded palms) to hold them in the described position. The hands were clenched into fists, which is evident from the typical spatial relationship between the preserved metacarpal bones and the phalanges of the fingers. The right hand is lower than the left, and is located under the chin.

The right lower limb is in a position of abduction in the hip joint of about 10° and flexion in the knee joint of about 15°. The left lower limb is in a neutral position in the hip joint and full extension in the knee. Antetorsion of the left femur is almost absent. The distal ends of the femur and tibia, which participate in the knee joint, are changed as if from static deformation. The bones of the foot are also deformed. This suggests a contracture in the left knee joint that occurred during life (the individual could not perform movements in the left knee). His gait was pathological (probably duck-like). The latter is also indicated by the high position of the left hip bone compared to the right. The left foot was on the right.

Both pelvic halves are identified, with the wings of the hip bones and part of the ischial bones above the ground. Both acetabulums are found. Overall, the pelvis has the characteristics of a male.

When determining the height from the preserved long bones, it was found:

Femur – 157.5 cm, Tibia – 182.79 cm, Humerus – 160.74 cm. Average value – 167 cm. The buried individual is probably a man of mature age – about 40 years old.

Grave № 4 – It is located about 50m east of the three described graves. Bone remains of 1 individual were discovered. The bones are poorly preserved and poorly

exposed. The burial is probably primary, sideways to the right, head – northwest. Bone remains are human and its condition is poor with predominant amount of bone fragments and detritus (**Fig. 5**).



Fig. 5. Skeleton № 5 (Grave pit № 4)

Skeleton № 5 – total length is impossible to measure, longitudinal axis – head-feet is south-north. Skull turned to the right shoulder and supine, face to the east

Burial facility № 5 is located in the Northwest-Southeast direction.

The dimensions are as follows: Length 250 cm, width at the head 60 cm, and at the feet 40 cm. The preserved depth of the grave pit is a maximum of 5-7 cm, as the grave was damaged by agricultural activities. The grave pit is simple, dug into the mainland terrain, without additional design. The pit has an elongated rectangular shape. The corners of the pit are slightly rounded.

Characteristics of the bones

Skull: Mechanically turned in an unnatural position, with the skull base up. Heavily fragmented. Parts of the lower jaw, temporal bone, both eye sockets and occipital bone are preserved. The height of the skull is 20 cm. The preserved teeth have initial abrasion – I – II degree.

Bones of the postcranial skeleton: Single bones from the chest and spine were found. A second cervical vertebra (axis) was found under the left side of the skull, and a first cervical vertebra, heavily fragmented, was embedded in the skull base itself.

Limb bones: Preserved : Upper limb: 1. Right humerus with a length of 29.5 cm. 2. Right ulna (fragment), 3. Right radius (fragment).

Fragment of right scapula, diaphysis of left humerus and proximal end of left ulna. Single carpal and precarpal bones and phalanges were found.

Lower limb: 1. Left fibula – 32 cm. 2. Right tibia – 34 cm 3. Right fibula – fragmented. The remaining bones are fragmented and less well preserved. Single bones from both feet were found.

The discovered skeleton belongs to a young male individual – about 20-25 years old. He was buried in a dorsal – lateral position. He had a slightly inclined and high forehead. The three long bones of the right upper limb are in one line, which indicates full flexion in the elbow joint. Both hands are gathered on the right next to the skull, with palms outstretched (due to the specific spatial arrangement of the phalanges at the

base of the skull). At the level of the chest, numerous bone fragments (bone detritus) mixed with soil are observed, as well as parts of vertebrae and ribs. The pelvic halves and the vertebrae of the final cervical, thoracic and lumbar regions are missing. In the place where the pelvis should be, numerous longitudinal cortical plates were found, similar to the corticalis of the femur. In their lower part (below the knees) the two lower limbs were laid parallel to each other, laterally.

This is indicated by the location of the two fibulae and the fragments of the left tibia. At the most distal, mixed with a small pile of soil, several foot and forefoot bones were found, which I cannot identify.

When determining the height from the preserved fragment of the proximal tibia using the regression equation of G. Steele, it was found that the height of the individual during life was about 180 cm.

Conclusion

The 2004 archaeological investigations in the Kozluka area along the Trakia highway revealed a complex, multi-period ritual site functioning primarily as a pit sanctuary, with most features dated to the 5th–early 4th centuries BC [7,8]. Four grave pits near the village of Malko Tranovo provided valuable anthropological data, including five individuals representing different ages and burial types. The graves displayed diverse orientations and body positions, from extended supine to flexed (Hocker-like) forms, with several cases indicating bound limbs suggestive of ritualized funerary practices [13]. The associated ceramic assemblage, particularly the hand-made cup from Grave № 3, supports the attribution of the burials to the Early Iron Age.

The studies confirmed the known data on the rites in the pit sanctuaries, but also revealed new cult elements – large multi-component structures, pit-pits, graves and pits with fragments of earlier ceramics. In over 56 pits from the classical era, ceramic pieces from the Early Iron Age were found, probably as an expression of ancestor worship – a practice also known from the sanctuary at Koprivlen [3].

Despite partial post-depositional disturbance from agricultural activities of one of the skeletons, the bone remains of others preserved sufficient integrity for reliable interpretation. The evidence reflects complex funerary behavior and possible social differentiation within the Thracian cultural sphere.

Following the completion of the excavations, it was ascertained that the site constituted an extensive and significant pit sanctuary of high hierarchical status within the Thracian settlement network of the Upper Thracian Lowland during the 1st millennium BC. Stratigraphic and material evidence indicate prolonged and continuous utilization of the site, spanning from the Early Iron Age – possibly extending back to the Early Bronze Age – through to the Roman period. The assemblage of Early Iron Age ceramics provides a crucial empirical basis for further investigation into the cultural dynamics and developmental trajectories of the region. The presence of imported Greek pottery and amphorae from the 5th century BC offers valuable insights into socio-economic interactions and aspects of daily life within the early Odrysian polity. Conversely, the absence of material culture from the Hellenistic period implies a reconfiguration of the settlement pattern after the mid-4th century BC. The stratigraphic contexts associated with the Roman era further introduce interpretative challenges and stimulate scholarly

inquiry regarding their spatial and functional relationship with earlier structural phases. Overall, the Kozluka findings significantly enhance understanding of Early Iron Age burial customs and ritual traditions in southeastern Bulgaria [13].

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