

## THE LATE MEDIAEVAL NECROPOLIS OF ALCEDAR. ANTHROPOLOGICAL DATA

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In 2015, at Alcedar, a village located in northeastern Bessarabia, on the bank of the Dniester, six burial graves were discovered by chance. These tombs are part of a late Mediaeval cemetery, belonging to the old place of worship, *i.e.* the wooden church attested in Alcedar in 1807 in the Parish registers of Bessarabia. The defuncts were buried according to the Christian ritual. The analyzed osteological material comes from six individuals: an adult man, four adult women and a sub-adult with a biological age of 11–12 years. At dental level, several epigenetic traits were determined (hypodontia, microdontia, variations in the number of cusps and roots), a position anomaly (version) and pathologies (dental caries, supragingival calculus and *antemortem* tooth losses). On the bone elements, identified as belonging to the category of epigenetic traits were the metopism, the sternal foramen, multiplication and enlargement of the mental foramen and the preauricular sulcus. Among the ossification abnormalities, *spina bifida occulta* has been identified. Regarding the anomalies acquired during life (pathologies), mention should be made, on the joint surfaces, of osteoarthritis. Physiological stress markers were detected on the skull (porotic hyperostosis), on the tibia (periosteal changes/ reactions) and on the dental crowns (linear enamel hypoplasia). A series of physical activity stress markers appear on the limbs. The results of the anthropological study bring new information about the health and lifestyle of a rural community having lived in the late medieval period, in poor conditions, on the right bank of the Dniester.

*Keywords:* Alcedar, late Mediaeval period, anthropological data, anomalies and pathologies, health status

## HISTORICAL AND ARCHAEOLOGICAL DATA

Alcedar, a locality documented since the beginning of the 17<sup>th</sup> century as part of Soroca County, is currently the village of residence of the commune with the same name in Soldanesti district (Republic of Moldova), located on the right bank of the Dniester River. However, according to the ceramic vestiges discovered by archaeologists, its beginnings can be found in the 15<sup>th</sup>–16<sup>th</sup> centuries. On the administrative territory of the Alcedar village several medieval sites are registered, among which a circular earth fortification from the 10<sup>th</sup>–11<sup>th</sup> centuries [17, p. 1–3; 46, p. 123–124; 55, p. 82].

The population census, conducted in the 1772–1774 in the Land of Moldavia, following the order given by the Russian military authorities for establishing the human resources and materials necessary for the army in conditions of war, records (between 1772–1773) for Alcedar, registered in the Lower Dniester Stan of Soroca County, 10 inhabited yards and huts and four deserted households, to which a clerical face, four Moldavian men free of personal services and two mazils or *ruptaş* (the class of merchants paying negotiated taxes) are added. The next census, conducted in 1774, states that the village has 14 houses, two of which abandoned. Regarding the guilds, one of the mazils (three members of the community) and another of the mercenaries (two members) are mentioned, to which a priest and four taxpayer peasants [46, p. 124–125] are added.

In 1817, the settlement of Alcedar was spread on a hillside, being populated by free peasants, landowners (*răzeși*). A needy village, with only seven privileged mazil men heads of households, another 53 men heads of households, seven bachelors and a widow constituting the bottom layer of the tax-paying (*bir*) peasantry. In 1820, the settlement of Alcedar had the following structure: a) the boyar class: three households, 13 bachelors and three women; b) the clerical class: eight households with male heads of household, five bachelors and five women; c) the mazils class: seven households, 15 bachelors and seven women; d) Moldavian peasants: 31 households, 59 bachelors and 31 women; e) Serbs: a household, three bachelors and a woman; f) Malorussians: 15 households, 28 bachelors and 15 women; g) Poles: a household, a bachelor and a woman; h) Gypsies: two households, a bachelor and two women; i) Jews: three households, three bachelors and three women [46, p. 126; 47, p. 224].

In 2015, in the vicinity of the actual church, dedicated to the Holy Voivodes Michael and Gabriel, built of masonry at the end of 1885, six burial graves were accidentally discovered, which are part of a late Mediaeval cemetery belonging to the old place of worship, *i.e.* the wooden church attested in Alcedar in 1807 in the Parish registers of Bessarabia. On the current estate of Alcedar village, two late Mediaeval rural settlements are known, one from the 15<sup>th</sup>–16<sup>th</sup> centuries and another from the 17<sup>th</sup>–18<sup>th</sup> centuries, but their necropolises were not identified [46, p. 127; 55, p. 82–83]. These six burial graves discovered in 2015 at Alcedar were investigated by specialists from the National Archaeological Agency of the Republic of Moldova. Probably, before the urgent intervention of archaeologists, several other burial graves were destroyed, the archaeological and anthropological information being unrecoverable and lost [46, p. 127]. The presence of this small group of six saved burial graves, along with those destroyed by the excavation works of the aqueduct ditch, proves the existence of a larger cemetery, the dimensions of which have not been established yet. The dead from the tombs of Alcedar were buried according to the Christian ritual: with their heads to the west and their eyes to the east, lying on their back, with their lower limbs outstretched and their upper limbs bent at the elbows, with their palms on the abdomen, chest or

shoulders. The overlaps reported in a few cases prove that the cemetery had a long-term use. The burial graves discovered in the hearth of Alcedar village belong to an old cemetery, which functioned in the late Middle Ages and also in the Modern period [46, p. 128–129].

#### MATERIAL AND METHODS

The analyzed osteological material consists of the bones of six individuals (noted G.1, G.2, G.3, G.4, G.5 and G.6) exhumed from six burial graves researched in 2015 on the area of the late Mediaeval necropolis of Alcedar. All these human remains were analyzed in 2015 in the laboratories of the National Archaeological Agency of Chisinau (Republic of Moldova).

After cleaning and reconstruction of the skeletal parts, the preservation status [13] and the representation status of the human remains [10, p. 5–8], followed by the taphonomic changes, were recorded [10, p. 95–106]. According to age at death estimation [10, p. 21–38; 14; 24; 34; 37; 40; 43] and sex determination [6; 9; 10, p. 16–21; 14; 54], biomorphometric data was collected [10, p. 69–84; 30–31]. The skeletal stature was estimated [48] and, wherever possible, the phenotypical appearance/ anthropological type was determined [7]. The presence of traumas, pathologies, skeletal abnormalities and epigenetic features/ traits was noted [1; 3–4; 10, p. 83–94, 107–158; 28–29; 32, p. 102–181; 35; 39; 52], as well as the skeletal particularities appreciated in literature as functional adaptations or daily activity stress markers [12; 18; 33; 36; 38; 51].

#### BIOLOGICAL DATA

**GRAVE NO. 1 (female, 30–35 Y.O., young adult)**, oriented west-east, with a rectangular pit, was signaled at a depth of about 0.5 m from the ground surface, its northern half being anthropically destroyed when digging an aqueduct ditch [46, p. 127, Figs. 2, 3].

*State of preservation and representation:* almost complete but fragmentary cranial segment (especially in the region of the facial bones); mandible and right half of the upper maxilla missing; almost complete postcranial segment (Fig. 1/1); satisfactorily preserved bones.

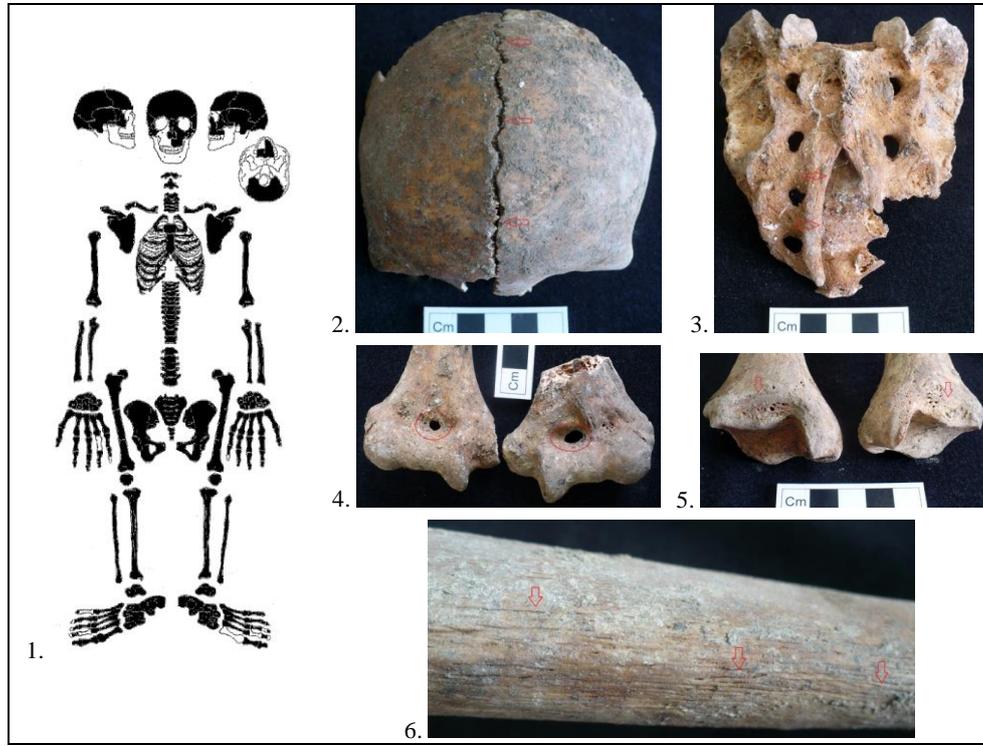


Figure 1. Grave no. 1, F, 30–35 Y.O. (young adult). 1. State representation of the skeleton (white – absent elements; hatched – present but incomplete elements; black – complete elements); 2. Frontal, metopism; 3. Sacrum, *spina bifida occulta* in the S3-S4 segments; 4. Humeri, distal epiphyses, supratrochlear foramina; 5. Tibiae, distal epiphyses, hyperdorsiflexion facets; 6. Tibia, diaphysis, periosteal changes/ reaction, inactive

**Biomorphometric data:** weak cranial relief; moderately wide forehead ( $ft-ft = 95$  mm) (Fig. 1/2); broad occipital; superficial canine fossa; short nasal spine; short zygomatics; gracile postcranial bones; platybrachyc humerus (70.0 u.i.), with weak muscle insertions; platymeryc femur (82.1 u.i. for the right and 79.3 u.i. for the left one, respectively), without pilastry; mesocnemic-eurycnemic tibia (70.0 u.i.); skeletal stature of cca. 158–159 cm (over-middle to high category); indeterminate anthropological type.

**Bone epigenetic traits and anomalies:** metopism (Fig. 1/2); *foramen sternale* (probably); *spina bifida occulta* (S3-S4 segment) (Fig. 1/3).

**Bone pathologies:** periosteal changes/ reactions on the tibial diaphyses, inactive (Fig. 1/6).

**Physical activity stress markers:** supratrochlear humeral foramen (bilaterally) (Fig. 1/4); additional femoral trochanter (unilateral, on the right side); hyperdorsiflexion facets (bilaterally) (Fig. 1/5).

**GRAVE NO. 2 (female, 50–60 Y.O., old adult)** was reported at a depth of 0.55 m, its pit not being noticed. The deceased was laid on his back, with the head facing west, the lower right limb outstretched and the upper right limb bent at the elbow, with the palm on the abdomen. The skeleton was precariously preserved, some of its components being absent (skull, left upper limb and left lower limb). In the chest area, a pierced Turkish silver coin, called *para*, from the time of Sultan Abdul Hamid I (1187–1203 H./ 1774–1789 AD) was found [46, p. 127–128, Figs. 2, 4].

*State of preservation and representation:* cranial segment represented only by a fragment of a parietal and by the mandible (without the left vertical ramus); almost complete postcranial segment (Fig. 2/1); advanced fragmentation in some postcranial skeletal regions; poor preservation state.

*Biomorphometric data:* gracile mandible, with button-like symphysis, without relief, with short and wide vertical ramus (Fig. 2/2); gracile postcranial bones; eurymeric femur (85.2 u.i.), without pilastry; skeletal stature of cca. 156–157 cm (over the middle category); indeterminate anthropological type.

*Dental pathologies:* total edentulation of the mandibular arch (Fig. 2/2).

*Bone pathologies:* degenerative osteoarthritis; corrosion on the cervical vertebrae bodies, alteration of the joint vertebral contour; small marginal osteophytes on the thoracic and lumbar vertebrae; periosteal changes/ reactions on the tibial diaphyses, inactive (Fig. 2/3).

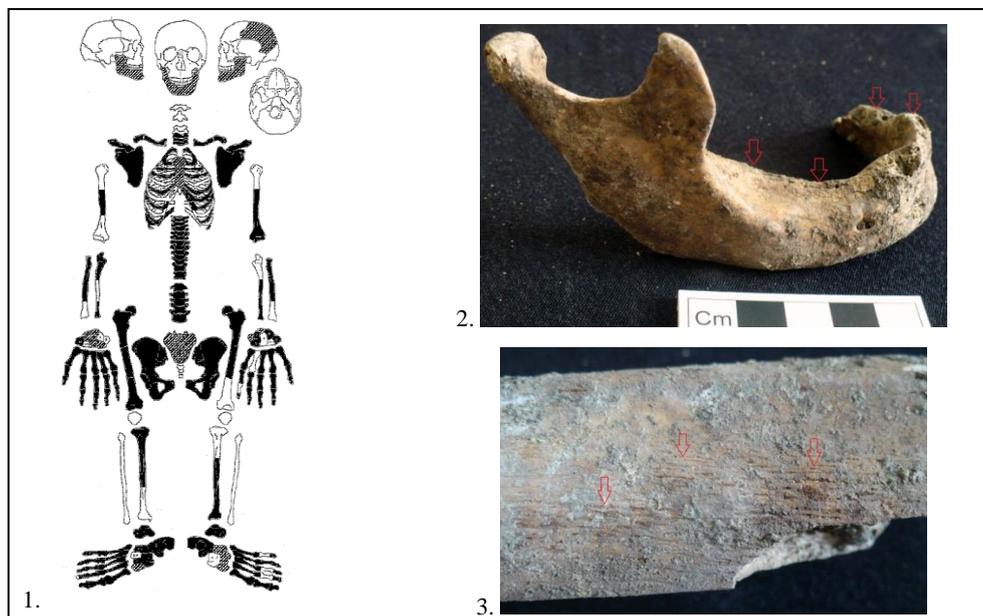


Figure 2. Grave no. 2, F, 50–60 Y.O. (old adult). 1. State representation of the skeleton (white – absent elements; hatched – present but incomplete elements; black – complete elements); 2. Mandible, edentulous arch; 3. Tibia, diaphysis, periosteal changes/ reaction, inactive

**GRAVE NO. 3 (female, 20–25 Y.O., young adult)** was discovered at a depth of 0.6 m, being revealed only in part. Only the skull of an adult individual was captured, the rest of the skeleton being probably southeast of the survey boundary. The pit was not noticed [46, p. 128, Figs. 2, 6].

*State of preservation and representation:* incomplete cranial segment, represented by several fragments from the parietal, occipital, left temporal, frontal, right zygomatic, left upper maxilla and mandible; incomplete postcranial segment (Fig. 3/1); poor preservation state.

*Biomorphometric data:* attenuated cranial relief; moderately broad forehead; broad occipital; short zygomatics; gracile postcranial bones; hyperplatymeryc femur (74.0 u.i.), with pilastry (108.3 u.i.); medium skeletal stature (probably); indeterminate anthropological type.

*Dental epigenetic traits and anomalies:* congenital absence of the left  $M^3$  (Fig. 3/2); microdontia of the right  $M_3$  (Fig. 3/3).

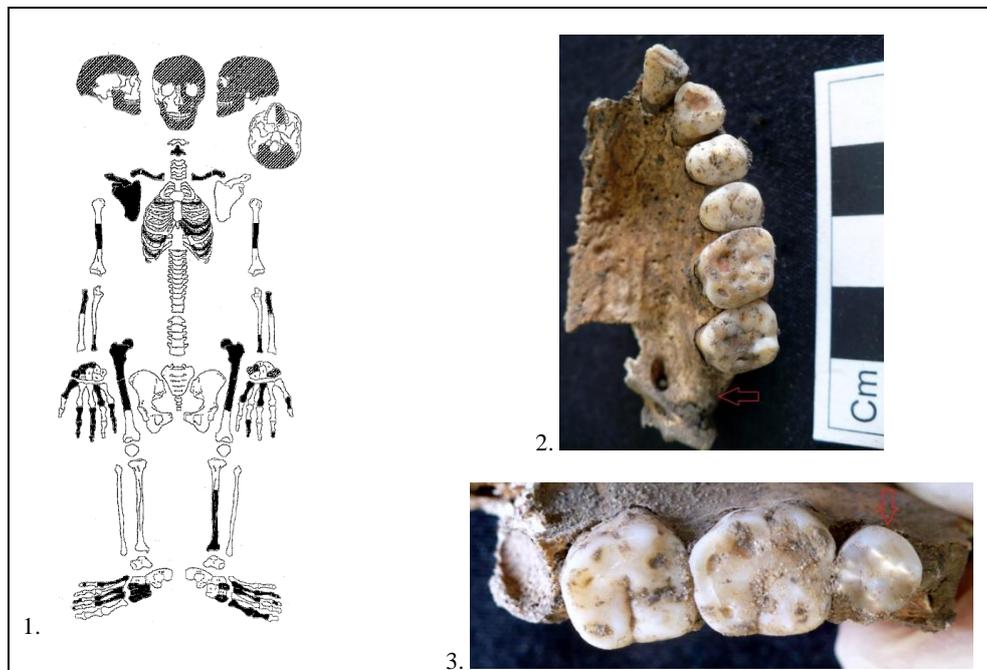


Figure 3. Grave no. 3, F, 20–25 Y.O. (young adult). 1. State representation of the skeleton (white – absent elements; hatched – present but incomplete elements; black – complete elements); 2. Left maxilla, congenital absence of the left  $M^3$ ; 3. Mandible, microdontia of the right  $M_3$

**GRAVE NO. 4 (male, 45-50 Y.O., middle adult)** was identified at a depth of 0.85 m, being oriented west-southwest – east-northeast, its western half being destroyed by digging the pit tomb no. 6. The pit had a rectangular shape. From the skeleton, preserved in anatomical position, there remained only the bones of the lower limbs, those of the pelvis and the lower part of the spine, the rest being moved north and south of the tomb [46, p. 128, Figs. 2/6].

*State of preservation and representation:* incomplete cranial segment, represented by several fragments from frontal, right temporal, parietals and mandible; postcranial segment represented by a rib, a humeral head and a scapula (Fig. 4/1); poor preservation state.

*Biomorphometric data:* pronounced cranial relief; moderately wide and inclined forehead (Fig. 4/2); robust mandible, with pronounced relief and high vertical ramus (Fig. 4/3); robust postcranial bones; indeterminate anthropological type.

*Dental epigenetic traits and anomalies:* hypodontia of the left M<sub>3</sub>; position anomaly (version type) of the left P<sub>1</sub>.

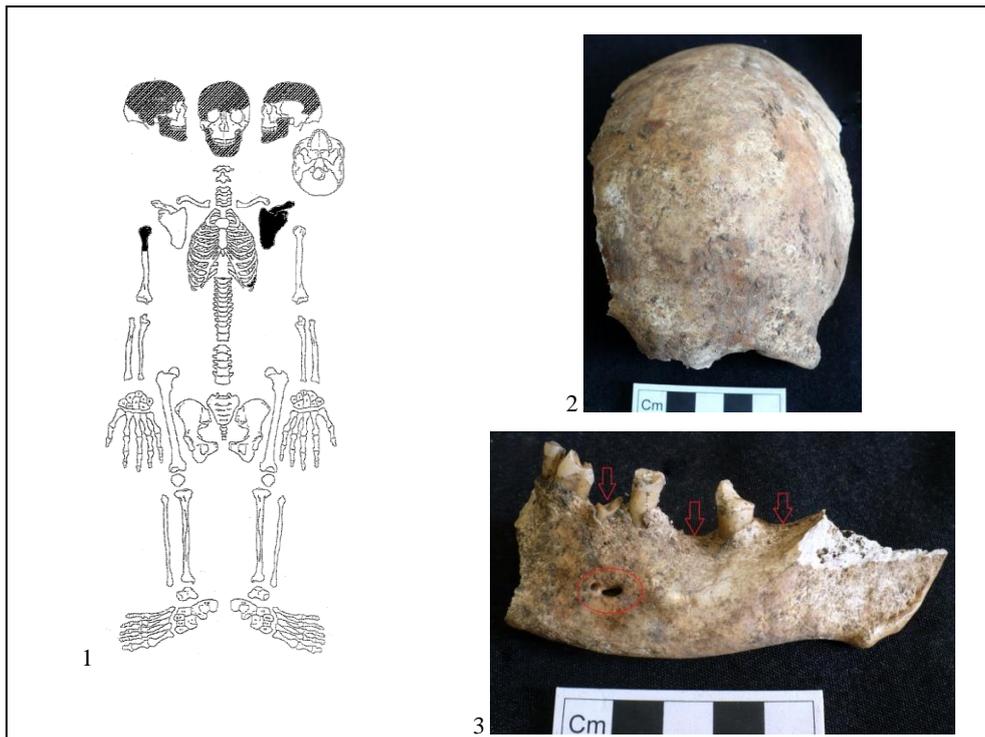


Figure 4. Grave no. 4, M, 45-50 Y.O. (middle adult).

1. State representation of the skeleton (white – absent elements; hatched – present but incomplete elements; black – complete elements); 2. Frontal, incomplete; 3. Mandible, left half, incomplete, *antemortem* tooth losses, advanced caries and enlarged, double mental foramen

*Bone epigenetic traits and anomalies:* double mental foramen on the left side of the mandibular body (Fig. 4/3).

*Dental pathologies:* *antemortem* tooth loss (left P<sub>2</sub> and left M<sub>1</sub>); advanced caries (root residue) on the left P<sub>1</sub> (Fig. 4/3).

**GRAVE NO. 5 (undeterminable, 11–12 Y.O., child-adolescent)** was intersected in the south-eastern part by graves no. 4 and no. 6. The pit was oriented on the west-east, having a rectangular shape with rounded corners. The skeleton was lying on its back, with the skull slightly bent to the left and the upper limbs strongly bent at the elbows, and the palms on the shoulders. Remains of the skeleton from burial grave no. 4 were found on the pelvis and lower limbs of this skeleton [46, p. 128, Figs. 2.7].

*State of preservation and representation:* approximately complete cranial segment; well-represented postcranial segment, almost complete (Fig. 5); satisfactory preservation state.

*Biomorphometric data:* gracile postcranial bones; permanent dentition; M<sup>2</sup> and M<sub>2</sub> unerupted, with calcified crowns; M<sup>3</sup> and M<sub>3</sub> uninterrupted, with non-calcified crowns; incomplete ossification; non-ossified proximal and distal epiphyses of the long bones of limbs; non-ossified coxal (ilium, ischium, pubis); indeterminate anthropological type.

Not visible with the naked eye dental and bone abnormalities or pathologies.

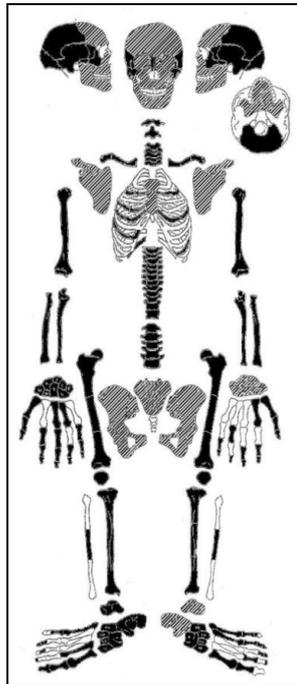


Figure 5. Grave no. 5, I, 11–12 Y.O. (child-adolescent). State representation of the skeleton (white – absent elements; hatched – present but incomplete elements; black – complete elements)

**GRAVE NO. 6 (female, 35–45 Y.O., young to middle adult)** was oriented west-southwest – east-northeast, with the pit of approximately rectangular shape. The complex overlapped graves no. 4 and no. 5. The skeleton was lying on its back, with the lower limbs outstretched and the upper limbs strongly bent at the elbows, with the palms brought to its shoulders. A perforated Turkish coin, the same *para*, from the time of Turkish Sultan Abdul Hamid I, was found in the rib cage [46, p. 128, Figs. 2/8].

*State of preservation and representation:* almost complete cranial segment – a *cranium*; very well represented, complete postcranial segment (Fig. 6/1); very good state of preservation.

*Biomorphometric data:* moderately long skull ( $g-op = 165$  mm), wide ( $eu-eu = 143$  mm) and moderately tall ( $po-b = 109$  mm); hyperbrachicranic cranial/cephalic index (86.7 u.i.); weak cranial relief; spheroid neurocranium in vertical view (Fig. 6/2–4); moderately deep canine fossa; high zygomatics, prominent, positioned in the same plane as the frontal; wide face ( $zy-zy = 131$  mm) (Fig. 6/5–6); moderately long nasal spine; broad occipital ( $ast-ast = 108$  mm), slightly curved, moderately high (Fig. 6/4); deep paraboloid palatal vault (Fig. 6/7); moderately wide nose ( $al-al = 25$  mm) (Fig. 6/5); moderately robust mandible (40.0 u.i.), with moderately high body ( $id-gn = 31$  mm), weak relief, attenuated like-button symphysis, wide and moderately high vertical ramus; moderate to weak horizontal profiling of the face ( $fmo-n-fmo = 15-16$  mm) (Fig. 6/5–6); moderately robust postcranial bones; platybrachyc humerus on the right side (72.0 u.i.) and eurybrachyc (79.2 u.i.) on the left side; hyperplatymeryc femur (68.8 u.i. on the right side and 71.0 u.i. on the left side), without pilastry; eurycnemyc tibia (84.4 u.i. on the right and 84.8 u.i. on the left); skeletal stature of cca. 162–163 cm (large category); Eastern-Europoid and Alpinoid typological features (Fig. 6/2–6).

*Dental epigenetic traits:*  $M_1$  with five cusps (bilaterally); microdontia of the right  $M^3$  (Fig. 6/7); biradicular upper molars (the left  $M^1$  and  $M^2$ ).

*Dental pathologies:* a thin layer of supragingival calculus; caries on the right  $M_3$ ; linear enamel hypoplasia on  $C^\#$  and  $C_\#$  (two hypoplastic defects on each crown, produced within 2.5–3.5 years, most likely during weaning).

*Bone epigenetic traits:* preauricular sulcus (bilaterally) (Fig. 6/9).

*Bone pathologies:* porotic hyperostosis on the occipital, inactive; periosteal changes/ reactions on the tibial diaphyses; hip osteoarthritis identified in the acetabular cavity (Fig. 6/8).

*Physical activity stress markers:* pronounced muscle insertions on the humeri; humeral supratrochlear aperture (bilaterally, yet more accentuated on the left side); squatting facets on the distal epiphyses of the tibiae (Fig. 6/10); femurs with subtrochanteric ridge and additional trochanter (bilaterally).



Figure 6. Grave no. 6, F, 35–45 Y.O. (young to middle adult). 1. State representation of the skeleton (white – absent elements; hatched – present but incomplete elements; black – complete elements); 2–4. *Neurocranium*, frontal, vertical and occipital views; 5–6. *Viscerocranium*, incomplete, facial and lateral views; 7. Upper dental arch, microdontia of  $M_3$ ; 8. Coxal, acetabulum, coxarthrosis; 9. Coxal, *sulcus preauricularis*; 10. Tibia, distal epiphysis, hyperdorsiflexion facet

### PALAEODEMOGRAPHIC DATA

The demographic group from Alcedar consists of six skeletons, five of which belonging to adults (a man and four women) and one to a sub-adult. Related only to the adult demographic batch, the mean age at death is 39.5 years. If we include the sub-adult, then we get a value of 34.8 years. The structure of this skeletal mini-series includes representatives of three generations; the minimum age at death is 11–12 years, and the maximum interval is 50–60 years.

### TAPHONOMIC DATA

All analyzed osteological remains suffered subaerial *postmortem* changes. The state of preservation is precarious in three cases (G.2, G.3 and G.4), satisfactory in two cases (G.1 and G.5) and very good in only one case (G.6). One skeleton is complete (G.6), two are approximately complete (G.1 and G.5), the rest being only partially (G.2) or poorly represented (G.3 and G.4).

Consistent limestone deposits have been identified on most skeletal elements, located on the surface of bone tissue, or even on some rupture lines or cracks. All fractures and cracks having led to the fragmentation of some skeletal components occurred *postmortem*, most in antiquity and only a few recently, during the uncovering and cleaning of bones from the pits. Although, in some cases archaeologists have found overlaps and intersections of pits, all skeletons have been discovered in anatomical connection, either complete or partial.

Traces of carnivores or rodents teeth are missing. On the surface of some bones a dendritic pattern occurs *postmortem*, caused by plant's roots. There are no visible signs of burning. No skeletal element has any traces of cutting.

### PALEOPATHOLOGICAL DATA AND HEALTH STATUS

The paleopathological study of the skeletal series from Alcedar gives us a glimpse on the life of a late Mediaeval community, interesting information about the health status of community members and their social status, about their concerns and daily activities, even about the degree of demographic openness.

At dental and bone level, some epigenetic traits, anomalies and pathologies were identified, some closely related to the lifestyle, others, to the episodes of physiological stress produced during childhood.

Dental epigenetic features are expressions of the normal variations, which show a certain genetic determinism. We mention two cases of hypodontia (the left  $M^3$  in the woman from G.3 and the left  $M_3$  of the man from G.4), *i.e.* the lack of a unit in the permanent dentition, determined by the non-formation of the dental bud

[22, p. 15; 25]. Microdontia, *i.e.* the presence of one or more smaller than normal teeth [22, p. 15–33] also occurs in two cases (the right  $M_3$  of the woman from G.3 and the right  $M^3$  of the woman from G.6). Variations in the number of molar cusps were identified only in one case (the woman from G.6 has both  $M_1$  with five cusps), as well as in the number of roots (the left  $M^1$  and  $M^2$ , each with two roots, also at the woman from G.6). A case of dental version has been identified, which is a positional abnormality that consists in the inclination of the longitudinal axis of the tooth in mesial or distal direction (the left  $P_1$  of the man from G.4).

Epigenetic traits on cranial and postcranial bone components are less obvious, compared to the dental ones. Metopism, a genetically determined defect of cranial sutural obliteration [3, p. 148–152; 11], referring to the persistence of metopic suture (on frontal bone) after early childhood, appears in the skeletal series from Alcedar only in the woman from G.1. Another defect with genetic determinism, this time of ossification, is the sternal foramen (possibly in the woman from G.1), located on the midline of the mesosternum, as a complete oval or circular opening [28, p. 117–118; 29, p. 543–545]. In the man from G.4, on the left side of the mandibular body, the mental foramen is enlarged and doubled. The mental foramen is traversed by a neuro-vascular bundle that feeds the lips and chin [3, p. 143–146; 29, p. 469, 473–481].

*Sulcus preauricularis*, which appears on the coxal bone as an elongated groove in the lower area of the iliac auricular surface, is present bilaterally only in the woman from G.6. Most likely, in this case, the preauricular sulcus is a parturition-type groove, which develops as a result of the tension of the ventral sacroiliac ligaments during birth, and subsequent inflammation of the peripubic area [2, p. 41–46; 19; 21; 29, p. 112–114, 604; 50].

Regarding the bone abnormalities on the elements of the spine, in the woman from G.1 we report *spina bifida occulta* (in the S3–S4 segment), which is a congenital anomaly located in the sacrum [29, p. 588–591], a defect with multifactorial causality, conditioned by complex polygenic interactions with environmental factors [15; 23].

Acquired dental and bone pathologies/ diseases appear as a result of disturbances of chemical or metabolic functions, under the influence of exogenous factors, yet they can be also conditioned by genetic or teratogenic factors.

As to dentition, in the skeletal series from Alcedar, the forms known in literature as common for the Mediaeval period were identified.

The presence of dental caries, an infectious disease favored by an imbalance in the oral cavity, resulting in demineralization of the dental hard tissues, was recorded in two cases, in the man from G.4 and in the woman from G.6. The main causal factors of the development of dental caries are poor oral hygiene, a diet rich in carbohydrates, lifestyle and genetic predisposition. High carbohydrate intake or certain dietary deficiencies can lead to an increased vulnerability of the teeth to cariogenic agents, manifested by decreased dental resistance, so that it turns caries into an indicator, even non-specific, of eating behavior.

Dental calculus is an organo-mineral complex adhering to the tooth surface (to enamel), resulting from the mineralization of bacterial plaque in an alkaline environment. The calculus is the precursor of all diseases of the periodontal tissues and the main cause of caries. The incriminating factors for the development of calculus are poor dental hygiene, local food preparation techniques or certain cultural activities. Calculus deposits, in their supragingival form, were identified only in the woman from G.6, in whom caries were evidenced on some dental units.

The tooth losses produced during life can be physiological, when the alveolus removes the affected tooth (together with the root), or intentionally, by extracting painful teeth, the latter procedure being widely practised in the Mediaeval period. *Antemortem* tooth loss was reported in two individuals – the woman from G.2 and the man from G.4. In the woman from G.2, with a biological age at death between 50 and 60 years, all teeth on the mandibular arch fell before death, so we are talking about total mandibular edentulation. This situation leads us to invoke a periodontal disease – one of the main causes of tooth losses produced during life, an acute degenerative disease, characterized by progressive withdrawal of the supporting tissues and fixation of teeth, a phenomenon followed by spontaneous dental removal. Periodontitis results from untreated gingivitis, resulting in destruction of the gingival tissue, leading to its withdrawal and to the appearance of oral lesions.

Regarding the wear of the dental crowns, it is of attrition type in all analyzed individuals, *i.e.* physiological, produced by the normal process of mastication. The molars show more advanced wear compared to other dental groups (premolars, incisors and canines).

Evidence of episodes of physiological stress produced in childhood, affecting the process of amelogenesis (formation of tooth enamel), was recorded in only one case – in the woman from G.6, whose canines have each two hypoplastic enamel defects. Enamel hypoplasia in this case is manifested by superficial linear grooved quantitative defects, arranged horizontally, on both sides of the crown, indicating episodes of acute physiological stress suffered during early childhood (from birth to age seven). Enamel defects reveal the moments when a slowdown in the dental processes of growth and development occurred, affecting only the teeth whose crowns were formed during the stress episode. Once formed, they are irreparable and become permanent features of the crown, and “memorize” the episodes of physiological stress produced during childhood [16; 42; 45]. Episodes of physiological stress in the case of the woman from G.6 occurred within the biological age range of 2.5–3.5 years, most likely during weaning, when child's body is susceptible to infectious and parasitic diseases.

On the bone elements, the acquired pathological diseases are generally reflected by the biological age at time of death. The paleopathological study aims at identifying diseases that leave specific traces at the level of skeletal components, helping us outline the osteo-biography of a missing community, assess health, detect suggestive markers of daily activities in the past, and capture aspects of morbidity. Thus, interpretations on the social and economic conditions existing in a community at a certain historical moment may be formulated.

The middle-aged (35–50 Y.O.) and old (over 50 Y.O.) individuals from Alcedar present on the skeletal components evidence of osteoarthritis – a degenerative joint disease of neuro-mechanical type, with proliferative and erosive character, characterized by loss of the cartilage that protects joint surfaces [35, p. 546–560; 52, p. 26–71]. Joint disease is manifested in two individuals: at the spine in the woman aged 50–60 years from G.2 (by corrosion, contour deformation and osteophyte) and at the coxo-femoral joint in the woman from G.6 (by corrosion).

In one case (the woman from G.6), detected on the occipital, in the vicinity of the lambdoid suture, in inactive form, porotic hyperostosis, also called exocranial porosity or *cribra cranii*, was present, which is the result of an abnormal growth of bone tissue on the neurocranial external vault caused by hyperplasia, and hypertrophy of the bone tissue [1, p. 348–351; 44]. The presence of this porosity is a useful tool in assessing the health, nutritional status and quality of life in an extinct population, thus becoming an extremely useful tool in the analysis of socio-economic stratification [53].

Periosteal changes/ reactions are a response of the body, through the periosteum (the outer layer that covers the entire surface of the postcranial bones), to an acute or chronic infectious inflammation. The periosteum responds to any pathological stimulus by hypervascularization and formation of new bone tissues, being often viewed as an indicator of physiological stress [52, p. 114–116]. In the skeletal series from Alcedar, such reactions were identified in three cases (the women from G.1, G.2 and G.6), always on the tibial diaphyses and inactive at the time of death. Inactive periosteal reactions are more difficult to distinguish compared to the active ones, because they are less porous, with a tendency to smooth, with an aspect of striations, so that the newly formed tissue merges with the adjacent tissue of the periosteum. The condition is non-specific and can be caused, for example, by the spread of a microbial infection to the periosteum, or by microtrauma that sometimes leads to inflammation of the periosteum. Other factors in the development of periosteal reactions may be blood-borne infections, treponematosi, tuberculosis, osteomyelitis, osteitis, but also avitaminosis, such as scurvy and rickets, as well as leukemia or other neoplasms [1, p. 310–311; 28, p. 155, 157; 52, p. 116].

#### PHYSICAL ACTIVITY STRESS MARKERS

Skeletal peculiarities, appreciated in the literature as functional adaptations or markers of daily physical activities, of functional or biomechanical stress, are also called mechanical enthesopathies or musculoskeletal and lifestyle indicators/ markers. These changes are located on the surface of bones, in the regions where the muscles are inserted through tendons and ligaments. The extent of their development, texture and depth can bring a series of information related to the daily activity of an individual or a community/ population.

In the women from G.1 and G.6, the supratrochlear opening is present on the distal humeral epiphyses. In both cases, it occurs bilaterally, in the G.6 woman the

opening being much more pronounced on the left side. The humeral septal opening, also called supratrochlear foramen, humeral perforation or septal diaphragm, is a feature/ trait included in both the category of atavisms [20,27] and in that of daily activity markers, being an effect of bone atrophy occurring after ossification due to mechanical pressure exerted by the ulnar olecranon on the humeral supratrochlear area, a situation manifested when the forearm is repeatedly stretched (flexion-extension movement), which would lead to atrophy of the ulnar olecranon process. Clumsiness and forcing of the passive limb are other possible causal factors [27,41].

Another feature/ trait, this time on the distal epiphysis of the tibia, is the hyperdorsiflexion facet, also called squatting or crouching facet which, in Alcedar, appears, as in the case of the trait described above, in the same individuals – the women from G.1 and G.6, bilaterally in both cases. Squatting facets on the tibio-talar joint occur as a result of the habit of sitting in hyperdorsiflexed position, a postural habit that produces bone remodeling, especially in individuals who perform physical activities with the body in this position [5,49]. Squatting was a constant habit until the end of the Middle Ages, later on the trend diminished, mainly due to the diversification of lifestyles [8].

Regarding muscle insertions, they are not extremely pronounced in the analyzed individuals, nor did they develop extensive enthesopathic changes. However, two situations stand out. The woman from G.6 has humeri with quite pronounced muscle insertions, which indicates ample movements of the arms in the anterior, posterior and lateral direction, repetitive flexion and extension of the forearms or supination movements, correlated with physical activities, such as carrying loads or lifting weights. In the same woman from G.6, but also in G.1, the femora have quite accentuated muscular insertions, subtrochanteric ridge and additional (third) trochanter. The subtrochanteric femoral ridge develops in the place of insertion of the muscles responsible for the movements of the thigh, flexion of the lower limb from the knee, and lateral rotation of the lower limb. These movements are correlated with activities such as walking on uneven ground or keeping the body upright for a long time. The additional femoral trochanter appears as a roughness in the posterior proximal third of the bone, in the immediate vicinity of the gluteal tuberosity. Some authors include the additional trochanter in the range of mechanical stress indicators, the additional trochanter having the role of increasing the insertion surface of the gluteal muscles, thus increasing the efficiency of muscle contraction [26].

## CONCLUSIONS

The six burial graves, discovered in 2015 in the hearth of Alcedar village and saved, belong to an old cemetery of the locality, used by the community in the late Middle Ages and in the modern period. Study of this skeletal batch, through biomorphometric, paleodemographic and especially paleopathological data, brings

new information about a rural community that once lived, in difficult living conditions, on the right bank of Dniester.

The picture of dental anomalies is not too diverse or very loaded, a situation that could suggest demographic openness. By the presence of tooth decay and losses we can deduce the poor state of dental health, which reflects harsh hygiene conditions (with the potential for the development of infectious and parasitic diseases), inadequate nutrition in terms of quality and quantity (with the potential for the development of metabolic diseases), unhealthy eating habits.

The presence of markers of physiological stress suffered by the body during childhood and adolescence, such as enamel hypoplasia, porotic hyperostosis and periosteal changes/ reactions, also indicates, albeit indirectly, poor health, difficult living environment (especially for the sub-adult population), implicitly a low socio-economic status for this population segment made up of ordinary people.

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