



ALLA KOROLYOVA

Nacionalinis pedagoginis Dragomanovo universitetas, Ukraina  
National Pedagogical Dragomanov University, Ukraine

# ANKSTYVŲJŲ ŽMOGAUS POPULIACIJŲ MIGRACIJOS MARŠRUTŲ REKONSTRUKCIJA

Reconstruction of Early Migration Routes of *Homo* Populations

## SANTRAUKA

Straipsnis pateikia monocentrinės ir policentrinės, arba multiregioninės, teorijos atstovų suformuluotas ginčytinas hipotetines žmonių populiacijų lokalizacijos versijas; apibrėžia pirmųjų žmonių migracijos Afrikos kontinente tikslus ir kryptis (į pietus, šiaurę ir rytus); analizuoja migraciją iš Afrikos kaip esminę antropogenezės stadiją ir jos motyvus: staigią klimato kaitą, hominidų pažintinių gebėjimų ir smegenų tobulėjimą, perėjimą prie naujo maisto ir naujos maitinimosi strategijos, prisitaikymą gyventi atvirose erdvėse, morfopsichologinius pakitimus.

## SUMMARY

The article represents the disputable hypothetical versions of the localization of the representatives of the *Homo* formulated by representatives of the monocentric and polycentric, or multiregional, theories. The purposes and directions (southern, northern and eastern) of migrations of the first representatives of the *Homo* within the African continent have been determined. The motives of their migration beyond the African continent as a key stage of anthropogenesis have been analysed. They are: ecological factor considered as a sharp change in the climate; development of cognitive abilities in hominids, i.e. the progressive improvement of the brain; transition to a new food strategy; adaptation to open spaces, morphophysiological changes.

**T**he modern stage of development of science continues to study not only the hypotheses of localization of the first representatives of the *Homo*, among which *Homo habilis* (the assumption of

F. Tobias)<sup>1</sup>, *Homo rudolfensis* and / or *Homo erectus (ergaster)* et al. could have been, but also to reconstruct the early routes / ways of their migration. Today one of the tested hypotheses regarding

RAKTAŽODŽIAI: ginčytinos hipotetinės versijos, lokalizacija, žmonijos atstovai, motyvai, migracija.

KEY WORDS: disputable hypothetical versions, localization, representatives of the *Homo*, motives, migration.

the localization of the representatives of *Homo sapiens* is associated with the study of the relicts of bones of ancient people, whose geological age is about 2/2.4 million years and it even exceeds

this boundary of time found on the territory of Eastern Africa<sup>2</sup>. It helps to explain a wave of scientific interest in the development of the theory of the *Homo sapiens*<sup>3</sup>.

## MONOCENTRIC AND POLYCENTRIC THEORIES ON LOCALIZATION OF REPRESENTATIVES OF THE *HOMO*

The main discussions of scholars actively continuing to develop this issue are focused on two theories of the origin of the *Homo sapiens*. The first theory is *monocentric*, according to which the place of origin of people of the modern physical type was a rather limited region in Africa, where they later settled throughout the planet, gradually displacing, as well as sometimes even destroying the autochthonous populations of hominids that preceded them. The second theory is *polycentric*, or *multiregional*, according to which the evolutionary formation of the *Homo sapiens* took place everywhere, i.e. in Africa, Asia and Europe, with the constant exchange of genetic material between populations of these regions<sup>4</sup>.

Most researchers tend to follow the monocentric theory, believing that the place of origin of a language and a human being is Africa (the theory of "black Eve"). This is confirmed by the data of modern genogeography, which O. Serebrovskiy called the historical science, but not the biological one<sup>5</sup>. For example, O. Balanovska and O. Balanovsky, studying the peoples of the world with a "single-parent" DNA marker (Y-chromosome inherited from the parent line and the mitochondrial DNA by the maternal line) tried to reconstruct the chain of suc-

cessive mutations ("from Adam" or "from Eve")<sup>6</sup>. Formulating certain assumptions, these researchers were guided mainly by anthropological material (fossil fuels) and they concluded that the first one is the mitochondrial DNA transmitted through the maternal line. This result is a persuasive argument in favour of the monocentric theory of the origin of humankind, in particular its "exit from Africa" as the most important stage in the settlement of a modern-day human around planet<sup>7</sup>.

During active research of mitochondrial DNA by population geneticists the study of another genetic system (Y chromosome), preserved in generations by the paternal line, is rapidly beginning to be studied. In this case the duo was formed, which became the standard in world research concerning this issue<sup>8</sup>. However, either one or another position dominated at different times.

Consequently, the controversy between monocentric and polycentric approaches continues up to this day and it is still far from its completion. However, the analysis of numerous works shows that the initiative is still on the side of the supporters of the theory of the African origin of the *Homo sapiens*<sup>9</sup>, because people of modern or very close to such a physical type appeared in Africa at the

end of the middle Pleistocene. In addition, the largest number of relicts of transient hominids has been found here from all continents. They allow at least in

general tracing the process of transformation of local *Homo erectus* into *Homo sapiens*<sup>10, 11, 12</sup> and further migrations of the latter.

## VERSIONS OF SOUTHERN, NORTHERN AND EASTERN MIGRATION ROUTES OF FIRST REPRESENTATIVES OF THE *HOMO* ON AFRICAN CONTINENT

The first wave of displacement of the most ancient populations of the *Homo sapiens* was already within **African continent**, which probably started at an early stage in the evolution of a human being with the release of it outside the territories of Kenya, Ethiopia and Tanzania (see the works of F. Grine, O. Zubov, K. Kuman, P. Tobias, etc.). According to O. Zubov, the earliest route of intra-African migrations was South. The following Southern African specimens evidence it: Stw 53 and SK 847 from Swartkran and Sterckfontein, where the latter is known as the *Telanthropus capensis* skull fragment, which was included to the taxons of the *Homo habilis sensu stricto*<sup>13</sup>. Although, according to P. Tobias, this relict is probably closer to *Homo erectus (ergaster)*<sup>14</sup>.

F. Grine has been studying the taxonomic status of the copies of Stw 53 and SK 847 for a long period and he proposed the assumptions concerning the similarity of fragments of these skulls among themselves, as well as their probable proximity to the *Homo habilis sensu stricto*<sup>15</sup>. K. Kuman, the anthropologist and archaeologist, from Johannesburg, studied the ancient finds in detail in the Sterckfontein area and he offered his own version of the age of specimens. The scholar suggested that the age of the copy of Stw 53 is equal to or greater than

1.8 million years<sup>16</sup>. F. Grine, W. Jungers and I. Schultz<sup>17</sup> mention the same date for both Stw 53 and SK 847.

It gives an opportunity to assume that the *Homo* populations spread to south from the original centre of its formation in antiquity, but probably later than 2 million years ago<sup>18</sup>. In addition, P. Dickfield, T. Plummer, J. Hicks et al., outlining the area of the first *Homo*, specify that it is likely that only Kenya and Ethiopia should be included in it, because the early Tanzanians of this kind have already arrived in Tanzania in the course of the first wave of migration to the south (Olduvay – 1.77–1.95 million years ago). The scholars support their assumptions with the available data for today's *Homo* penetration into Tanzania, which were obtained from the Oldoubia discoveries, in particular, due to the stone tools (aged 2.2 million years old) found in the south of the Canberra region<sup>19</sup>. At the same time, O. Zubov points to the following key point: the most ancient dating associated with the *Homo* show a chronological sequence, fixing the spread of human populations from the primary centre to the south<sup>20</sup>.

At the same time, the materials of the excavations in the Domanis (1,7 million years ago) demonstrated the following assumption: in the very ancient times,

shortly after the chronological turn of 2 million years to the present day, the migration has begun in Africa, in the northern direction with orientation to the west<sup>21</sup>. According to M. Sahnoumi, D. Hajoys and their colleagues, one of the published dates of the Aine Kaneh camps in Algeria is in the direction of the first migrations of the *Homo*: 1.77–1.95 million years ago<sup>22</sup>. Although other scholars (D. Herraads, V. Eisternmann, J.-P. Reynal) refer to this site up to 1.2 million years<sup>23</sup>.

O. Zubov notes that in such a distance from the “cradle of humankind” region of Africa – the *north* and *north-west* – a human being first came over a million years ago. If we talk about the physical type and taxonomic status of a human being spread throughout the African continent in the period 1,8–1,5 million years ago, it was already *Homo erectus (ergaster)* (its early form), which can be judged behind the relicts of the skeleton of a teenager from Nariokotome, dated from the same time interval. This species was probably formed in the area of “cradles of humankind” based on the *Homo habilis sensu lato* in the process of adaptation to meat food, long-distance movement, open space conditions, etc. Perhaps, these people had already new proportions of extremities (long legs), endurance while walking and running, but they did not have any hair on the body. Comparing this species (*Homo habilis sensu lato*) with the previous species (*Homo erectus (ergaster)*), the scholar admits that the *Homo erectus (ergaster)* have qualitative progress in the technology of stone tools – the transition from Mode 1 to Mode 2, i.e. to Achilles technology, which belonged to mankind in the

course of the next many hundreds of thousands of years<sup>24</sup>.

M. Dominguez-Rodrigo states that the development of the stone industry in ancient hominids was closely linked to the general process of their evolution, assuming that “large tools [...] entered into practice in connection with the necessity for carcass processing large animals, including splitting bones for brain use, as well as to increase the level of protection during collisions with competitors in the fight for meat and onward – for use in hazardous hunting”<sup>25</sup>. However, this is not all the functions of the purposeful use of the processed stone in the economy of the most ancient human being. “Today archaeologists have proved that heavy flint chips used to be used in the described period for the processing of wood”<sup>26</sup>.

A group of archaeologists headed by M. Dominguez-Rodrigo, who worked in Tanzania (Peningh), conducted a detailed study of the instruments of the Early Ashley type using a microscopic photolysis analysis of the relicts of ancient plants and studied the nature of the damage of the stone at the edge of the products. The work confirmed the previously prescriptive dating of the Ashley technologies – 1.7–1.5 million years old up to the present and demonstrated the high probability of its primacy in Africa, somewhere not far from the “cradle of humankind.” At the same time, according to the Spanish scholar’s version, “the development of technological skills of mankind clearly demonstrates the improvement of complex behaviour of this branch of hominids. It includes the targeted actions with prediction of the expected result and expan-

sion of the range of economic practice"<sup>27</sup>.

Subsequently, one of the first representatives of the Homo – *Homo erectus* (*ergaster*) mastered almost the entire territory of Africa to the south, east and west of the ancient ancestral homeland. It was demonstrated the following findings: lower jaws of Tygenif (northwest, 700 thousand years old) and skull from Eritrea-Danakil (east, more than 1 million years old), including the above-mentioned copies: Stw 53 skeletons and SK 847 (1.8 million years old)<sup>28</sup>. The last two fragments are likely to be intermediate links between *Homo habilis sensu lato* and *Homo erectus* (*ergaster*), which can be the provision of the origin of a new link in the evolution of *Homo* in Africa. Perhaps, this stage of anthropogenesis proceeded according to the genetic type of development, in contrast to the model of the formation of the first *Homo*<sup>29</sup>.

Referring to the scholars, in whose works the dating of Indonesian findings are attributed to their own *Homo erectus* (*ergaster*), O. Zubov states that in the described periods, the eastern direction of intra-African migrations can be observed<sup>30</sup>. However, for example, Japanese anthropologists and geneticists once again review the preliminary data and call less ancient dates for initial human migration to Eastern and Southeast Asia, somewhere not earlier than 1 million years ago<sup>31</sup>.

In the end, it should be noted that the widespread settlement of the most ancient populations of the human race on the African continent probably occurred in all directions during the period of 0.5–0.7 million years after the occurrence of the first people. Based on anthropological data, it should be assumed that the most ancient people almost did not cross the limits of “cradle of humankind” 2,4–2,2 million years ago: these are the regions that now fall within the boundaries of Kenya, Ethiopia with the centre in the area of Lake Turkana (Rudolf) and Tanzania partly. We note that the migration activity of the first *Homo* at that time was limited geographically to the territory of “cradle of humankind,” but chronologically – the “boundary” of 2.0–2.2 million years up to the present. Nevertheless, in these relatively narrow spatial-temporal frameworks there were the events of global scale in the evolution of hominids, which served as the beginning of the long path of human development towards the *Homo sapiens*: the occurrence of the Homo, its unique adaptive reorganization in the new rapidly changing conditions, including changing the food strategy and locomotion nature, preparation of the entire morphophysiological complex to the formation of a new, more progressive type of *Homo* (*erectus*) *ergaster*, which is called “undoubtedly the first human being”<sup>32</sup>.

#### MIGRATIONS OF REPRESENTATIVES OF *HOMO* BEYOND AFRICAN CONTINENT AS A KEY STAGE OF ANTHROPOGENESIS

Today in global sciences (S. Anton, W. Leonard, M. Robertson, V. Eswaran, H. Harpending, A. Rogers) the following questions remain open: “where?”

(boundaries of which territory), “when?” (approximate time, dating) and “who?” (which kind of the *Homo*) “crossed” the African geographical boundary and en-

tered the spaces of Eurasia for the first time<sup>33</sup>.

In the works of M. Volpoff, there is the question of the role of technology progress as an incentive for migration, but at the same time it emphasizes the important role of the development of cognitive abilities in hominids in the process of their resettlement<sup>34</sup>. A. Turner argues about it and he emphasizes the role of brain evolution in such processes<sup>35</sup>. "These thoughts refer to a very important aspect of the theory of anthropogenesis, including the question of Plio-Pleistocene migrations of hominids"<sup>36</sup>.

According to O. Bar-Josef, the American scientist, the environmental factors were one of the most important reasons that could have triggered the migration of ancient *Homo* groups from Africa. The scholar mentioned the following: "the first migrations of hominids from Africa were caused by climate change, occurred about 1.6 million years ago," and possibly, about 1.8 million years ago. Speaking about the impact of the sharp climate change of the global and, in particular, the African scale, on all aspects of the life of hominids, he also drew attention to the nature of the impact of this factor on the processes of species formation and further migration<sup>37</sup>.

Taking into account the most common views, according to which the "exit" took place at the end of the "cradle" period in the evolutionary stage of the *Homo erectus* (*ergaster*), M. Butovska mentions the several reasons for the resettlement of the early *Homo* beyond Africa: 1) rapid population growth, which is based on an increase in life expectancy; 2) improvement of child care strategy; 3) development of altruism; 4) progress of methods

of extraction and cooking (development of fire); 5) increase in the size of the territories inhabited by different groups; 6) ability to vary food strategies, etc.<sup>38</sup>.

There are versions that "people have left Africa not by coercion and not because of hunger," but because "it was an appropriate opportunity for them to use the developed adaptation opportunities to the maximum benefit for themselves, because the necessary preconditions were formed as a result of anatomical adaptations, as well as through the use of sophisticated tools"<sup>39</sup>. The last factor on the tool "is based on a more general and profound reason for the expansion of the *Homo* – a progressive improvement of the *brain*, the volume of which constantly increased in the process of evolution. Starting from the stage of the "cradle" and already at later stages of the existence of the *Homo rudolfensis*, he exceeded 770 cm<sup>3</sup>"<sup>40</sup>.

However, due to the environmental catastrophe scale, one of the key reasons is the global climate change began at the end of the Miocene and was 2.5 million years ago. This macro-factor included "cooling, aridization, forming large open extinctions of many species (in particular hominids). For the *Homo* this meant the necessity for a substantial rearrangement of all the morphophysiological and behavioural complexes inherent in the ancestral forms – *A. africanus*: an increase in the overall body size, lengthening the legs due to the vital task of overcoming large distances with a periodic transition to rapid running, improvement of mechanisms thermoregulation"<sup>41</sup>.

A transition to animal, more caloric food was of great importance for the *Homo*. Quantitative and qualitative (which is especially important) improvement of

the diet contributed to accelerating the evolution in a specific human version, but a new strategy for the extraction of food led to the necessity for constant long-term transitions, the improvement of guns and so on. This was an impetus for the expansion of the territory occupied by the most ancient species of the *Homo*<sup>42</sup>. In this case, the investigations of S.K. Anton, A. Fachroel, Z. Yahdi, the anthropologists, show that the area occupied by the species *Homo rudolfensis* exceeded the area of *A. africanus* 10 times (!)<sup>43</sup>, which could have caused the expansion of the

species. All these aspects of progress meant the formation of a new species that corresponded to the system of macro-factors, which became the prerequisite and incentive for the migration of hominids from Africa<sup>44</sup>.

Another interesting hypothesis that has probably become an incentive for the “exit” of the *Homo* from Africa is the geographical factor – the presence of areas adjacent to Africa with similar natural conditions, which seemed to be the continuation of familiar, well-developed African lands<sup>45</sup>.

## CONCLUSIONS

As a result, it should be noted that the early migration of representatives of the *Homo* beyond Africa was due to the following reasons: environmental factor – a sharp change in climate (O. Bar-Josef); important role for the development of cognitive abilities in hominids (M. Volpoff) – progressive improvement of the brain (O. Zubov); transition of the early *Homo* to the *new food strategy* (Van der Merwe); adaptation to open spaces (S. Anton et al.); corresponding morphophysiological changes (O. Zubov). In addition, the settlement of the oldest *Homo* became possible and necessary because of: 1) general population growth (the first factor), which is based on an increase in life expectancy; 2) im-

provement of child care strategy; 3) development of altruism; 4) new way of extraction and cooking (development of fire); 5) increase in the size of the territories inhabited by different groups; 6) ability to vary food strategies, etc. (M. Butovskaya).

In conclusion, it should be noted that there was a stress on total morphophysiological reorganization in a human being in the process of anthropogenesis. It which also contributed to migration – finding more suitable conditions for life and to get rid of stress. This version is considered to be one of the most important reasons for the large movements of the ancient *Homo* groups and it is called “Great Migration.”

## Literature and References

<sup>1</sup> Вишняцкий Л. В. 2005. *Введение в преисторию. Проблемы антропогенеза и становления культуры. Курс лекций. 2-е изд., испр. и доп.* // Кишинёв: Высшая Антропологическая Школа. с. 42.

<sup>2</sup> Зубов А. А. 2011. *Становление и первоначальное расселение рода Ното*. СПб.: Алетейя. с. 15.

<sup>3</sup> Вишняцкий Л. В. 2005, с. 6.

<sup>4</sup> Вишняцкий Л. В. 2005, с. 5–6.

- <sup>5</sup> Серебровский А. С. 1930. *Проблемы и метод геногеографии* // Труды Всес. съезда по генетике, селекции, семеноводству и племенному животноводству. Л. Т. 2. с. 71–86.
- <sup>6</sup> Балановская Е. В., Балановский О. П. 2009. *Генетические следы исторических и доисторических миграций: континенты, регионы, народы* // Вестник ВОГиС. Т. 13. № 2. с. 401.
- <sup>7</sup> Ibid.
- <sup>8</sup> Ibid.
- <sup>9</sup> Вишняцкий Л. В. 2005, с. 6.
- <sup>10</sup> Cann R. L., Stoneking M., Wilson A. C. 1987. *Mitochondrial DNA and human evolution* // Nature. 325. p. 32–36.
- <sup>11</sup> Pearson O. M. 2004. *Has the combination of genetic and fossil evidence solved the riddle of modern human origins?* // EA. Vol. 13. No. 4. P. 145–159.
- <sup>12</sup> Forster P., S. Matsumura. S. 2005. *Did early humans go North or South?* // Science. Vol. 308. p. 965–966.
- <sup>13</sup> Зубов А. А. 2011. *Становление и первоначальное расселение рода Homo*. СПб.: Алетея. с. 31.
- <sup>14</sup> Tobias P. V. 1991. *The skulls, endocasts and teeth of Homo habilis* // Olduvai Gorge. Cambridge. Vol. 4. p. 1–921.
- <sup>15</sup> Grine P. E. 2000. *Implications of Morphological Diversity in Early Homo Crania from Eastern and Southern Africa* // Humanity from African Naisance to Coming Millennia. Witwatersrand/Firenze. p. 107–117.
- <sup>16</sup> Kuman K. 1994. *The archaeology of Sterkfontein – past and present* // J. Hum. Ecol. Vol. 27. P. 471–495.
- <sup>17</sup> Grine F. E., Jungers W. L., Schultz J. 1996. *Phenetic affinities among early Homo crania from East and South Africa* // J. Hum. Evol. Vol. 30. P. 189–225.
- <sup>18</sup> Зубов А. А. 2011, с. 32.
- <sup>19</sup> Ditchfield P., Hicks J., Plummer T., Bishop L. C., Potts R. 1999. *Current research on the Late Pliocene and deposits north of Homo Mountain, southwestern Kenya* // J. Hum. Evol. Vol. 36. p. 123–150.
- <sup>20</sup> Зубов А. А. 2011, с. 32.
- <sup>21</sup> Ibid.
- <sup>22</sup> Sahnouni M., Hadjouis D., Made 1. van der, Abd-el-Kader Derradji, Canals A., Medig M., Belahrech H., Harichane Z., Rabhi M. 2002. *Further research at the Oldowan site of Ain Hanech, North-eastern Algeria* // J. Hum. Evol. Vol. 43. p. 925–937.
- <sup>23</sup> Geraads D., Raynal J.-P., Eisenmann V. 2004. *The earliest human occupation of North Africa: a reply to Sahnouni et al.* // J. Hum. Evol. Vol. 46. p. 751–761.
- <sup>24</sup> Зубов А. А. 2011, с. 32.
- <sup>25</sup> Dominguez-Rodrigo M., Serralonga J. &, Juan-Tresserras J., Alcalá L. & Luque L. 2001. *Woodworking activities by early humans: a plant residue analysis on Acheulian stone tools from Peninj (Tanzania)* // J. Hum. Evol. Vol. 40. p. 289–299.
- <sup>26</sup> Зубов А. А. 2011, с. 33.
- <sup>27</sup> Dominguez-Rodrigo M. et al. 2001, p. 289–299.
- <sup>28</sup> Abbate E., Albanelli A., Azzaroli A., Benvenuti M., Tesfamariam B., Bruni P., Cipriani N., Clarke R. J., Ficcanelli A., Macchiarelli R., Napolioni A., Papini M., Rook L., Segri M., Tecle T. M., Torre D., Villa J. 1998. *A one-million year-old Homo cranium from Danakil (Afar) depression of Eritrea* // Nature. Vol. 393. p. 458–460.
- <sup>29</sup> Зубов А. А. 2011, с. 33.
- <sup>30</sup> Ibid.
- <sup>31</sup> Hyodo M., Nakaya H., Urabe H., Saegusa H., Shunrong Xue, Jiyun Y., Xuepin J. 2002. *Paleomagnetic dates of hominid remains from Yuanmou, China and other Asian sites* // J. Hum. Evol. Vol. 43. p. 27–41.
- <sup>32</sup> Зубов А. А. 2011, с. 33.
- <sup>33</sup> Ibid, с. 140
- <sup>34</sup> Волпофф М. Н. 1997. *Из Африки* // Человек заселяет планету Земля. М. с. 38.
- <sup>35</sup> Тернер А. 1997. *Распространение ранних гоминид* // Человек заселяет планету Земля. М. с. 7–21.
- <sup>36</sup> Зубов А. А. 2011, с. 41.
- <sup>37</sup> Бар-Йозеф О. 1997. *Нижнепалеолитические стоянки Юго-Западной Азии свидетельства расселения человека из Африки* // Человек заселяет планету Земля. М. с. 56.
- <sup>38</sup> Бутовская М. Л. 1997. *Социальная структура ранних гоминид и проблема адаптации к различным климатическим условиям в палеолите* // Человек заселяет планету Земля. М. С. 21–29.
- <sup>39</sup> Волпофф М. Н. 1997, с. 38.
- <sup>40</sup> Зубов А. А. 2011, с. 43.
- <sup>41</sup> Ibid, p. 44.
- <sup>42</sup> Ibid.
- <sup>43</sup> Anton et al. 2000, p. 91–102
- <sup>44</sup> Зубов А. А. 2011, с. 44.
- <sup>45</sup> Ibid, p. 44–45.