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MİLLET AGRİCULTURE DATA REVEAL THE GEOGRAPHİC SPREAD OF TRANSEURASİAN LANGUAGES

Darı Tarımı Verileri Transavrasya Dillerinin Yayılım Coğrafyasını Ortaya Koymaktadır

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Abstract

This study examines how data on millet agriculture contribute to explaining the geographic spread of the Transeurasian languages, based on the research titled *"Triangulation supports agricultural spread of the Transeurasian languages"* by Martine Robbeets and colleagues. The study addresses the origins and dispersal of Transeurasian languages—such as Japanese, Korean, Tungusic, Mongolic, and Turkic—through the triangulation method, which integrates linguistic, archaeological, and genetic evidence. The central argument of the research is that the common ancestry of the Transeurasian languages can be traced back to Neolithic millet-farming communities that emerged approximately 9,000 years ago in the West Liao River Basin of Northeast China. Linguistic evidence supports this hypothesis by identifying a shared core vocabulary related to agriculture, plant cultivation, and textile production. Archaeological findings further demonstrate that millet agriculture spread gradually from this core region toward the Korean Peninsula, the Amur River Basin, and the Japanese archipelago. Ancient DNA analyses indicate that this agricultural expansion was not merely a process of cultural transmission but was also accompanied by demographic movements resulting in genetic continuity across these regions. The study argues that the early dispersal of the Transeurasian languages was largely driven by agriculture-based population expansions, while later historical periods were characterized by migrations, contact, and linguistic interaction that partially obscured this shared heritage. By foregrounding millet agriculture data, the research provides an interdisciplinary and coherent framework for understanding the geographic spread of the Transeurasian languages and contributes to broader discussions on population history and language dispersal in Eurasia.

Keywords: Transeurasian languages; millet agriculture; language dispersal; triangulation method (linguistics–archaeology–genetics); language–agriculture relationship

Öz

Bu çalışma, Martine Robbeets ve çalışma arkadaşları tarafından yayımlanan *"Triangulation supports agricultural spread of the Transeurasian languages"* başlıklı araştırmayı inceleyerek, darı tarımına ilişkin verilerin Transavrasya dillerinin yayılım coğrafyasını nasıl açıklayabildiğini değerlendirmektedir. Söz konusu çalışma, Japonca, Korece, Tunguzca, Moğolca ve Türkçe gibi Transavrasya dillerinin kökeni ve yayılımını, dilbilim, arkeoloji ve genetik disiplinlerini bütünleştiren üçgenleme (triangulation) yöntemi aracılığıyla ele almaktadır. Araştırmanın temel savı, Transavrasya dillerinin ortak kökeninin yaklaşık 9.000 yıl önce Çin'in kuzeydoğusunda yer alan Batı Liao Nehri Havzası'nda gelişen darı tarımına dayalı Neolitik topluluklara uzandığı yönündedir. Dilbilimsel veriler, özellikle tarım, bitki yetiştiriciliği ve dokumacılıkla ilişkili ortak bir temel söz varlığının varlığını ortaya koyarak bu savı desteklemektedir. Arkeolojik bulgular ise darı tarımının söz konusu merkezden başlayarak Kore Yarımadası, Amur Havzası ve Japonya'ya doğru aşamalı biçimde yayıldığını göstermektedir. Antik DNA analizleri, bu tarımsal yayılmanın yalnızca kültürel bir etkileşimle sınırlı kalmadığını, aynı zamanda nüfus hareketleriyle bağlantılı bir genetik süreklilik içerdiğini ortaya koymaktadır. Çalışma, Transavrasya dillerinin erken dönem yayılımının büyük ölçüde tarım temelli demografik genişleme süreçleri sonucunda gerçekleştiğini; daha sonraki tarihsel evrelerde ise göçler, temaslar ve dilsel etkileşimlerin bu erken ortak mirası kısmen maskelediğini ileri sürmektedir. Bu yönüyle araştırma, darı tarımı verilerini merkeze alarak Transavrasya dillerinin yayılım coğrafyasına ilişkin tartışmalara disiplinlerarası ve bütüncül bir çerçeve sunmaktadır.

Anahtar Kelimeler: Transavrasya dilleri; darı tarımı, dil yayılımı; üçgenleme yöntemi (dilbilim–arkeoloji–genetik); dil- tarım ilişkisi

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INTRODUCTION

The subject of this review is a review of the study "Triangulation supports agricultural spread of the Transeurasian languages" by Martine Robbeets et al. The exploration appeared on pages 616 - 621 of issue 599 of the scientific journal Nature on 10 November 2021. The paper essentially attempts to prove the relationship of the Transeurasian or Altaic languages i.e. Japanese, Korean, Tungusic, Mongolian and Turkish, and discusses them in the context of linguistics, archaeology and genetics. By "Transeurasian languages" in the title, Turkish, Mongolian, Tungusic, Korean and Japanese are meant here. The preference for the term "Transeurasian languages" instead of "Altaic languages" results from the fact that the long-standing discussions, first in connection with the Ural-Altaic and then with the Altaic languages, have not yet reached a clear conclusion, despite the new findings of established research (Nature, p. 616).

To make the text more comprehensible, the scientific team has included maps and illustrations of the research work that visualise the distribution of the 98 Transeurasian languages in the past and present, as well as other topics. The present-day languages are represented by coloured areas and the historical varieties by red dots. Figures 1.a and b on page 617 reconstruct the predecessor languages of Transeurasian spoken in the Neolithic (coloured red) and in the Bronze Age and later (coloured green). Detailed information on the determination of the homeland and the estimated temporal depth based on Bayesian inference can be found in the supplementary data under 4.

The spatio-temporal distribution and clustering of the Neolithic (red) and Bronze Age (green) sites in the archaeological database has also been put into perspective for the geographical distribution of the 255 sites. Supplementary data on page 25 show the spatial and temporal distribution of millet and rice cultivation, as well as the cultural similarities identified by Bayesian analysis. The distribution of archaeological sites in Figure 2 on page 618 shows that it is smaller than the distribution of contemporary languages in Figure 1. In this figure, the team illustrates the early distribution of linguistic subgroups in the Neolithic and Bronze Age, while focusing on the links between the eastward expansion of agricultural basins and the distribution of languages.

According to the researchers, the spatio-temporal distribution and mixing of ancient genomes and QpAdm modelling of the proximate mixing of 20 important ancient populations can be studied in detail in Figure 4. For the integration of linguistic, agricultural and genetic dispersal in Northeast Asia, the Amur line is marked in red, the Yellow River line in green and the Jomon line in blue on Map 4. Red arrows indicate the eastward migration of Neolithic, Korean and Tungus millet farmers to the indicated regions. Green arrows indicate the integration of rice cultivation in the Late Neolithic and Bronze Age and the arrival of the Japanese language in Japan via Korea.

Main section

This research recognises that in the context of linguistics, archaeology and genetics, the origin and distribution of speakers of Transeurasian languages such as Japanese, Korean, Tungusic, Mongolian and Turkish are among the most controversial issues in Eurasian population history. The study focuses on establishing the links between linguistic diffusion, agricultural expansion and population movements, which it sees as the main problem. And so, it has identified the origin of the speakers of the aforementioned languages as a basic method by "triangulating" the disciplines of genetics, archaeology and linguistics in a unified perspective, which I can say is a new method of achieving the result.

The research group presents extensive datasets from these disciplines, including a comprehensive transeurasian agropastoral base vocabulary, an archaeological database of 255 Neolithic to Bronze Age sites from Northeast Asia, and an ancient genome collection from early grain farmers in Korea, the Ryukyu Islands and Japan that complements previously published genomes from East Asia. In addition, the study found that the common origin and main spread of the Transeurasian languages can be traced back to the first farmers who moved across Northeast Asia since the early Neolithic, but that this common heritage has been obscured by extensive cultural interactions since the Bronze Age. By bringing the results together, the study not only made significant advances in three different disciplines but also opened the debate that the early spread of Transeurasian speakers was driven by agriculture (Nature, p. 617).

The results of this research on the origin of the Transeurasian languages have been widely reported in the media. This research, which is exciting in terms of methodology, is being followed closely by the scientific world, but some scientists prefer to view the topic rather cautiously.

Combination in triangulation: linguistics, archaeology and genetics

The research group has combined the linguistic, genetic and archaeological in a unified perspective in triangulation and found, "*Triangulation of linguistic, archaeological and genetic evidence shows that the origins of the Transeurasian languages can be traced to the onset of millet cultivation and the early Amur gene pool in Neolithic Northeast Asia*."

According to their findings, the spread of these languages - and thus of agriculture and genes - occurred in two main phases: The first split in the Transeurasian family must have occurred during the Early and to Middle Neolithic, when millet farmers with Amur-related genes spread from the western Liao River into neighbouring regions. The second split, characterised by language contacts between the five branches of the descendants, took place during the Late Neolithic and the Bronze and Ice Ages, when millet farmers with strong Amur ancestry mixed with other peoples and incorporated rice into their food crops.

"Millet" in the inherited vocabulary

The problem of whether the Transeurasian languages form an independent language family and whether the Japanese languages belong to this family is one of the most discussed topics in historical-comparative linguistics. Most linguists agree that these languages have numerous similarities and are historically related. However, there is disagreement about the exact nature of the relationship. According to them, the similarities of these languages arose through heredity, they claim that the vocabulary and other linguistic features are evidence of derivation from a common ancestral language, while another group of linguists believes that the similarities are due to borrowing.

Martine Robbeets, the first author of the 2021 study published in Nature, who has spent 20 years researching the origin and distribution of the Transeurasian languages, and her colleagues combined linguistic, genetic and archaeological methods to find that the Transeurasian languages share a common basic vocabulary. For example, words for agriculture, such as millet, field, sowing or weaving, and for making clothes. Archaeological findings and genetic analyses show that their origin probably goes back to millet farmers who lived in the West Liao River Basin in northeast China 9,000 years ago. There is evidence that these farmers were the common ancestors of the peoples who speak Transeurasian languages today (Nature, p. 617).

Thanks to the dataset of 3193 findings and 254 basic lexical concepts from 98 Transeurasian languages, including dialects and historical language variants, it was possible to construct a phylogenetic tree showing the Proto-Eurasian origin of the languages some 9181 years ago. The results suggest that Proto-Altaic, the "umbrella language" of Turkish, Mongolian and Tungusic, is slightly older than 6811 years. On the other hand, linguistic evidence suggests that the Japanese - Korean branch of Proto-Altaic split from the first language 5458 years ago. In other words, the origins of the Transeurasian languages were in the western Liao River basin in the early Neolithic and were extended north, west and east by Bronze Age migrations. In this vast area, the languages evolved independently under natural conditions (Nature, p. 617).

The researchers found that the words in the reconstructed Ur-language provide clues to the lifestyle of the speaker. The researchers assume that the constructed words are also used by the speakers. Accordingly, words like "field", "sow" or "cultivate" refer to the cultivation of plants, while words like "sew", "weave" or "spin" refer to textile production. Furthermore, the researchers found that the original vocabulary referred to the cultivation of millet, wheat or barley, but not to the cultivation of rice. In contrast, subfamilies that diverged in the Bronze Age, such as Turkish, Mongolian, Tungusic, Korean and Japanese, added new subsistence terms referring to rice, wheat and barley cultivation, dairy farming, domesticated animals such as cattle, sheep and horses, agricultural implements or kitchen utensils, and textiles such as silk. These words are borrowings from linguistic interaction between Bronze Age peoples speaking different trans- and non-trans-Eurasian languages. (Nature, p. 617).

Archaeological evidence

The group of scientists led by Robbeets also tried to determine the origin of the Trans-Asian languages based on archaeological data. **Archaeological** evidence of millet cultivation points to the western Liao Basin as the starting point. Millet cultivation was impressively confirmed by these archaeological investigations. The research group selected 255 Neolithic and Bronze Age sites for the analysis of plant remains and identified the Western Liao Basin as the centre of Neolithic cultures, where panic millet cultivation began 9000 years ago. From the Western Liao Basin, millet cultivation spread to Korea about 5500 years ago and to the Amur region about 5000 years ago. Rice cultivation was not introduced as a crop until about four thousand years before our era (Nature, 618).

Since migration is not associated with monothetic archaeological cultures, Neolithic agricultural expansions in Northeast Asia have been associated with some diagnostic features, such as stone tools for sowing and harvesting, and textile technology. Domesticated animals and dairy farming also played an important role in the expansion into Western Eurasia. However, with the exception of domesticated animals such as dogs and pigs, there is little evidence in the database. In their research, the researchers also noted the connection between agriculture and population migration, as well as the similarities in pottery, stone tools, dwellings and funerary architecture between Korea and western Japan (Nature, 618).

Citing previous studies, the researchers provide an overview of the demographic changes that accompanied the introduction of millet cultivation in the regions, emphasising that millet farmers generally adopted a more extensive

settlement pattern. In the Neolithic, population densities increased in Northeast Asia before a population collapse occurred in the Late Neolithic. After the Bronze Age, populations in China, Korea and Japan increased exponentially.

Common genetic origin

As a third link, **genetics** provides further evidence for migration. Given recent advances in sequencing ancient DNA, the team of scientists felt that re-examining the links between human, linguistic and cultural dispersal in Eurasia could lead to new insights. In their view, East Eurasia is still under-researched compared to West Eurasia. In particular, Northeast Asia - the vast region encompassing Inner Mongolia, the Yellow River, the Liao and Amur basins, the Russian Far East, the Korean peninsula and the Japanese islands - is clearly underrepresented in the new literature. Indeed, with a few exceptional studies focusing on genetics or limited to reviewing existing records, truly interdisciplinary approaches to Northeast Asia are rare. (Nature, p. 618).

The genetic analysis of this study shows that the Western Liao River Basin, the centre of origin of Transeurasian languages and millet cultivation, was also the area where language and millet culture spread to the same regions. To this end, the research group combined existing genome analyses with newly collected ancient DNA data. The analysis shows that all speakers of the Transeurasian languages can be traced back to the genetic profile of the Amur. During the Neolithic, Korean and Tungusic languages arrived in the East with the migration of millet farmers. This was followed by a large migration from Korea to Japan in the Late Neolithic and Bronze Age, which was associated with language and rice cultivation (Nature, p. 620).

The "theory of descent" put forward by Robbeets et al., based on reliable evidence going back 9000 years, might indeed be enough to convince some scientists not to be negative and critical of the results of scientific research in the three disciplines. It is high time to move the rigid paradigmatic attitude towards the language families discussed here to its rightful place in history.

Epilogue

This comprehensive research, led by Martine Robbeets and a further 39 scientists including Remco Bouckaert, Matthew Conte, Alexander Savelyev, Tao Li, Deog-Im An, Ken-ichi Shinoda, Yinqiu Cui, Takamune Kawashima, Geonyoung Kim, Junzo Uchiyama, Joanna Dolińska, Sofia Oskolskaya,Ken-Yōjiro Yamano, Noriko Seguchi, Hirotaka Tomita, Hiroto Takamiya, Hideaki Kanzawa-Kiriyama, Hiroki Oota, Hajime Ishida, Ryosuke Kimura, Takehiro Sato, Jae-Hyun Kim, Bingcong Deng, Rasmus Bjørn, Seongha Rhee, Kyou-Dong Ahn, Ilya Gruntov, Olga Mazo, John R. Bentley, Ricardo Fernandes, Patrick Roberts, Ilona R. Bausch, Linda Gilaizeau, Minoru Yoneda, Mitsugu Kugai, Raffaela A. Bianco, Fan Zhang, Marie Himme, Mark J. Hudson, & Chao Ning appears to have achieved the predicted result. This success is largely due to the fact that, in addition to the European researchers, the team also included those with at least one Transeurasian language as a first language.

The research group has gathered converging evidence to show that the early spread of the Transeurasian languages was driven by agriculture and has made significant progress in three individual disciplines.

It is important for me to emphasise that this ground-breaking research success means that a paradigmatic theory that for many years was considered untouchable for various reasons (most likely for simple political reasons), namely that the Transeurasian languages did not originate from a common ancestral language, can be considered to have been disproved by the scientific work of Robbeets et al. Because of all this scientific evidence, the research results became the subject of various scientific studies and were even widely reported in the popular media.

REFENCES

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