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## Prehistoric and Early Historic Agricultural Landscapes in the Kislovodsk Basin (Northern Caucasus, Russia).

Agricultural landscapes; Northern Caucasus; Late Bronze Age; Early Middle Age.

In the context of searching for agricultural landscapes which have escaped more recent anthropogenic disturbance, the antiquities of the Kislovodsk basin have especial importance. Preliminary analysis of the archaeological antiquities of the Kislovodsk basin, from the Aeneolithic to modern times, has revealed several periods of very high population density and several so far inexplicable periods of very low population figures, of which the most recent falls in the 14th–18th cents. AD when the area was practically depopulated, until 1803 when the fortress of Kislovodsk was founded.<sup>1</sup> The above circumstance was especially important for the preservation of archaeological monuments, which have survived in very good condition due to the absence of anthropogenic impact.

The closed geography of the Kislovodsk basin, and the fact that it is relatively well-studied, allowed the creation, for the first time in this country, of an archaeological GIS for the microregion, which currently includes data on over 900 archaeological sites, from the Aeneolithic to modern times. At present the Kislovodsk basin is rightfully considered to be the best-studied microregion in the North Caucasus from the point of view of archaeology.<sup>2</sup>

Traces of terrace agriculture in the Kislovodsk basin are numerous, and have for decades attracted the attention of scientists. Investigations at agricultural terraces in the Kislovodsk basin have been conducted since the mid-1990s and up to the present day,<sup>3</sup> and include aerial photography and GIS modeling.<sup>4</sup> The above works gave rise to two main viewpoints concerning the time when terrace agriculture could have first appeared in the Kislovodsk basin. Some authors date its origins to the Early Bronze Age on the basis of radiocarbon analysis of buried soils,<sup>5</sup> whereas others date the emergence and functioning of the terraces to the early Middle Ages, also on the basis of radiocarbon analysis of the soils<sup>6</sup> or the spatial association of the terraces with fortifications which date to the time in question.<sup>7</sup>

It should be noted that the above hypotheses on the time of emergence and existence of terrace agricultural plots in the microregion have their vulnerable points. On the one hand, they are based on field and desk observations which reveal that some of the terrace plots are associated with monuments from a certain period, and on the other hand on radiocarbon dating of buried soils. Hence the authors decided to conduct a new

1 Afanas'ev, Savenko, and Korobov 2004, 69.

2 Afanas'ev, Savenko, and Korobov 2004; Reinhold and Korobov 2007.

3 Arzhantseva, Sedov, and Skripnikova 1998; Turova, Bronnikova, and Chichagova 2003; Skripnikova 2004; Skripnikova 2007.

4 Afanas'ev, Savenko, and Korobov 2004.

5 Skripnikova 2004, 181–184; Skripnikova 2007, 40.

6 Arzhantseva, Sedov, and Skripnikova 1998, 12.

7 Afanas'ev, Savenko, and Korobov 2004, 71–85.

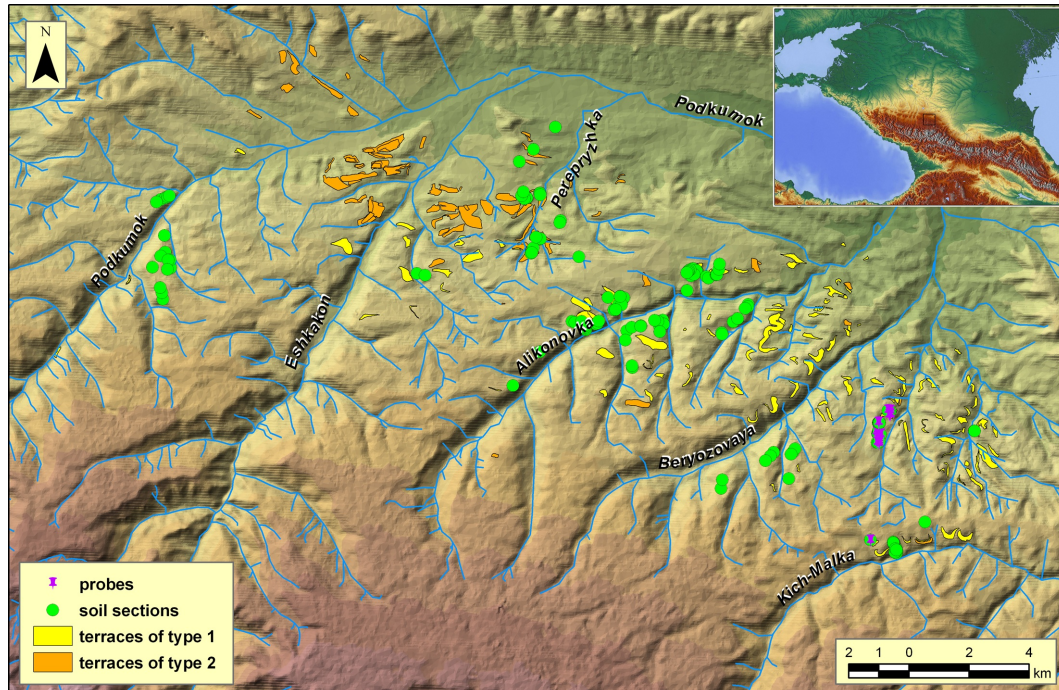


Fig. 1 | Results of archaeological soil studies in the Kislovodsk basin in 2005–2011.

interdisciplinary study of terrace agriculture in the Kislovodsk basin, using GIS methods and archaeological soil studies in order to identify the age of the phenomenon and the extent of its influence on the ecology and landscapes in the region.

In 2005–2011 we conducted large scale investigations at terraces and other traces of ancient agriculture in the valleys of all the main rivers in the basin (Fig. 1). The investigations included mapping the visible contours of the terraces and the boundary walls using GPS and instrumental topographic mapping of the present-day surface. We did 161 soil sections and 39 probes in different landscapes and different types of agricultural plots. Much attention was given to the archaeological material from the sections, especially to the pottery which comprises over 3000 fragments.

The investigations allowed the identification of three main types of agrarian land plots which functioned in the Kislovodsk basin in different periods (Fig. 2a–2c):

- 1) single, double or triple large terraces with high banks, on steep slopes;
- 2) cascades of long low-rise terraces on smoother slopes;
- 3) sloping promontories with rectangular plots and boundary walls.

The main issue in studies of ancient agriculture is to identify the time of emergence and existence of different land plots. One of the ways to do that is through analyzing the spatial association of the agricultural plots with the various settlement sites, for which GIS methods can be used. We have conducted GIS mapping of the types of land plots described above, using aerial photography. We have analyzed about 500 aerial photos from 1970–1975, and also CORONA space images (September 20, 1971, mission 1115) which have the space resolution of around 1–2m.

The maps show quite clearly that terraces of the two types are encountered in different areas (Fig. 1). Terraces of the first type cover about 129km<sup>2</sup> and are distributed more or less evenly throughout the eastern part of the basin, whereas terraces of the second type are located mostly in its western part and occupy about 49km<sup>2</sup>.

However, there is a third type of agricultural plot that we discovered in the Kislovodsk basin: rectangular fields with boundary walls. Barely visible on aerial photos, they can

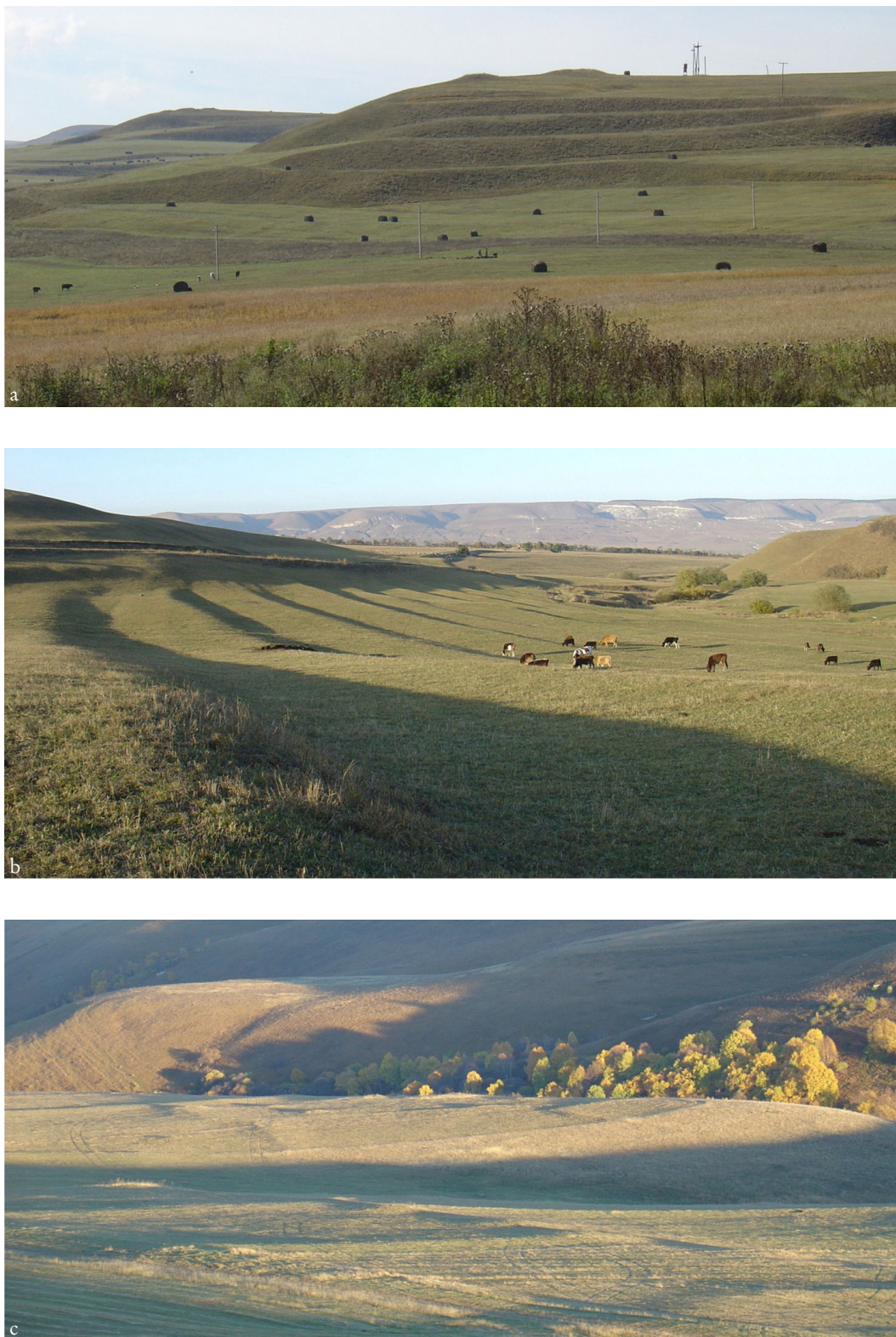


Fig. 2 | Main types of agrarian land plots in the Kislovodsk basin: (a) terraces of the first type; (b) terraces of the second type; (c) rectangular plots with boundary walls.

only be discovered on-site when the light is favorable. At present we have discovered three plots with traces of such land division, and yet another is visible on aerial photos.

After juxtaposing the terraced areas within the basin and the location of the 13 hitherto discovered Maikop culture settlements, we cannot agree with the high estimates for the Early Bronze Age farmer population figures, nor with the assumption that almost all the terraces are associated with settlements which date to the 4th–2nd millennia BC.<sup>8</sup> Comparison of the areas where terraces of the first type are encountered with settlement sites of the Koban culture appears to be much more substantiated. The zones where the types of terraces are encountered are clearly correlated also with early medieval Alanic fortifications, so it is possible to speak of a link between them. Hence in order to identify the origin of agricultural plots we need data from pedological and archaeological studies.

In 2005–2011 we did 190 full-profile sections and probes, of which 47 sections and 33 probes were on terraces of the first type. Practically all the sections revealed a large amount of pottery fragments in the buried soil and in the humified diluvium, which allows dating the time of emergence and existence of the agricultural plots (on pottery fragments in fertilizer see e.g.: Wilkinson<sup>9</sup>). Of the over 3100 pottery fragments that were found in the sections, over 65% belong to Koban culture. Early medieval ware comprises 28% of the finds, whereas about 6% of the shards are unidentifiable. We should note that Koban pottery dominates in sections from several landscapes: on the type 1 terraces themselves, below the terraces on sloping promontories, and above the terraces at the top of the watershed hills.

On the basis of pedological and archaeological investigations we can state that the Koban culture population of the Kislovodsk basin had a highly-developed agriculture and, apparently, an agricultural economy. The agricultural activities of the Koban culture population were taking place at the peak of paleoenvironmental changes, and brought about catastrophic consequences, as a result of which the territory fell into disuse for about five hundred years.<sup>10</sup>

We have also identified that in the 1st millennium AD the Alanic population used two types of agricultural plot. The first type was worked with ploughs or some heavy mouldboard tools pulled by several pairs of oxen. This technique of land use created long narrow terraces on slopes, which in our classification are the second type of agricultural plot in the Kislovodsk basin. The terraces have analogies in European literature where they are called strip lynchets.<sup>11</sup> We assume that the Alans may have used this form of agricultural plot during the first half of the 1st millennium AD when they were moving into the Kislovodsk basin, where such terraces are located mainly in the lower reaches of the river Eshkakon where it flows into the Podkumok. However, most of the agricultural plots in question are within 5km of Rim-Gora, a major settlement from the 10th–12th cents. AD, hence we cannot exclude that it was inhabitants from this settlement who practiced the style of tillage described above.

The second type of plot is small rectangular or square areas enclosed with low stone walls. Such fields could have appeared after cross-plowing with an ard pulled by two oxen. The plots with stone boundaries are evidently related to the fortified settlements which date to the 5th–8th cents. BC. That is the period to which we should provisionally date the plots of this type, which have numerous analogies among the so-called Celtic fields.<sup>12</sup> Instead of indicating a regression, the more primitive tillage tools and simpler tillage techniques that appeared in the middle of the 1st millennium AD appear to reflect the specific traits of Alanic settlement in a new landscape.

8 Skripnikova 2004, 183; Skripnikova 2007, 40.

9 Wilkinson 1989.

10 Reinhold and Korobov 2007, 196.

11 Fowler and Evans 1967; Taylor 1966; Bradley 1978, 267; Fries 1995, 134, 152.

12 Brongers 1976; Bradley 1978; Müller-Wille 1979; Fries 1995; Fries-Knoblach 2001.

The new types of agricultural plots in the environs of Kislovodsk have direct analogies in Europe, and this is the first such case in studies of medieval agriculture in this country. The new data on North Caucasian agriculture in the 1st millennium BC—1st millennium AD shows that the chances of discovering traces of similar or other types of agricultural activity are higher than scholars previously estimated them to be.

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