

Physical Geography

Absolute Age of the Relief of the Black Sea Coast Zone of Georgia Based on Archaeological Materials

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ABSTRACT. On the basis of archaeological material and radioisotope dating it is concluded that the land surface of the zone of the Black Sea coast of Georgia escaped from the sphere of active wave action 3500-3600 years ago. Since then the settlement in the coastal zone began. © 2007 Bull. Georg. Natl. Acad. Sci.

Key words: abrasion, accumulation, terrace, transgression, regression, facies, stratigraphic section, Holocene transgression, New Black Sea transgression.

Modern relief of the land surface of accumulative and accumulative-abrasion coasts of the Black Sea is represented by the strip of the New Black Sea terrace and littoral sandy and sandy-pebble dunes that emerged concurrently. In the coastal zone of Georgia the New Black Sea wide terrace (First Marine, Old Black Sea, Holocene) 3-6 m high and 150-300 m long has developed between the Tsikhisdziri cape and the confluence of the river Natanebi, in the coastal zone, situated between the confluences of the rivers Kodori and Gumista, between the estuary of the river Bzipi and the town of Gagra, between the Gantiadi settlement and the estuary of the river Psou and other places. Near the river mouths the surface of the New Black Sea terrace passes imperceptibly to the first upper grove terrace. On the intensively settled areas of the above specified coastal zone the surface of the New Black Sea terrace is smoothed, making a flattened step in the coastal relief. In the less settled sections of the shore (between the confluences of the rivers Natanebi and Ghalidzga) the New Black Sea terrace is, as a rule, represented by a strip of sandy-pebble dunes.

The establishment of the modern relief of the Black Sea coast zone of accumulative and accumulative-abrasion type started in the second half of the Holocene epoch, during the last 4000 years. Fluctuation of the sea level, together with wave regime and alluvial deposits brought to the sea by rivers, has much contributed to this process. Fluctuation of the sea level (alternation of transgression and regression phases) determined the character of erosion-accumulation and bogging processes, the frequency and extent of floods in the coastal zone and the adjacent territories greatly affecting processes of colonization of the coastal zone and economic activities of the population settled there. Among the reasons of sharp worsening of political and economic situation in countries of the Black Sea coast in the second half of the first millennium the ecologic factor (climate, fluctuation of sea level and the bogging process connected with it) is referred to along with other causes (military, trade and economic). Proceeding from this, determination of the age of the present relief of the marine zone and study of the peculiarities of its formation are – apart from paleographic interest – important in terms of archaeological studies as well.

Formation of the New Black Sea terrace and the strip of littoral dunes is connected with the New Black Sea phase of the Black Sea Holocene transgression, during which the sea level became 2-3 m higher as compared to the modern one [1, 2]. On an average a 5-8 m thick horizon of deposits of littoral-marine facies (sand, pebble) accumulated along the accumulation type marine coast of Georgia during the process of New Black Sea transgression. In the process of the next Phanagorian (Egrisian) regression the modern relief of the coastal zone was formed in the horizon of the above mentioned deposits [1, 2].

The date of formation of the relief of the coastal zone is not determined exactly, since the duration of the New Black Sea transgression phase itself remains unclear so far. The mentioned transgression is thought to have started 5500 years ago and ended 3000 years ago. According to archaeological data and on the basis of radioisotope dating, the rising of water level at this transgression ceased earlier, 3500-3600 years ago. This is evidenced by archaeological material collected in the water-side of the Black Sea coast of Georgia from the surface of the New Black Sea terrace, the narrow littoral strip of dunes and adjacent 250-500 m wide strip of marine plain. In particular, cultural strata, dated to the 14th-15th cc. B. C. [4, 5], are fossilized in the sands building up the New Black Sea terrace. To the 10th-12th cc. B. C. are dated the oldest strata of the Late Bronze monuments of Kulevi, Ochamchire, Sokhumi and New Athos also connected with surface deposits, constructing the New Black Sea terrace, littoral dunes and the adjacent plain.

According to these data, in the 11th-15th cc. B. C. relief of the coastal zone had already escaped from the sphere of active wave action and was used by the population for different purposes.

A 0.4-0.6 m thick turf horizon was attested as a result of drilling at a depth of 4-5 m of the deposits making up littoral dunes, situated between the mouths of the rivers Khobistskali and Enguri. The age of the upper stratum of the horizon was defined as 4050 ± 60 and 4060 ± 50 years [2]. A stratigraphic section of similar structure was denuded during the strong storm of 1982 as a result of washing off the littoral margin of the New Black Sea terrace situated between the mouth of the river Bzipi and the town of Gagra (Figure). Here too a turf horizon was attested under the New Black Sea deposits. By radioisotope



Fig. Erosion profile near Gagra showing upper Holocene marine deposits overlying a middle Holocene peat formation (PhotoV. Peshkov).

dating the age of the upper stratum of the horizon was defined as 4170 ± 90 ; 4280 ± 60 years and the age of the lower strata as 4800 ± 90 and 5420 ± 90 years [2].

It can be assumed on the basis of an analysis of archaeological data and radioisotope dating that the phase of the New Black Sea transgression began approximately 4100-4200 years ago and lasted till the period preceding the present moment by 3500-3700 years. The recent sea coast (the strip of the spread of the New Black Sea terrace and littoral dunes) in the New Black Sea phase of transgression represented the upper part of the subaqueous slope of the coastal zone, on which accumulation of deposits of littoral-marine facies took place. Nearly 3500-3600 years ago the New Black Sea phase of transgression was superseded by the Phanagorian regression, which lasted till the 2nd-3rd cc. B. C. During the mentioned regression the sea level declined by at least 2 m as compared with the modern one [2]. It happened at the very beginning of Phanagorian regression 3500-3600 years ago when the New Black Sea coast came out of the zone of active wave action and, accordingly, the specified date should be considered as the age of its origin.

ფიზიკური გეოგრაფია

საქართველოს შავი ზღვის სანაპირო ზონის რელიეფის აბსოლუტური ასაკი არქეოლოგიური მასალების საფუძველზე

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(წარმოდგენილია აკადემიის წევრის ზ. ტატაშიძის მიერ)

არქეოლოგიური მასალისა და რადიონახშირბადული დათარიღების საფუძველზე გაკეთდა დასკვნა, რომლის მიხედვით შავი ზღვის სანაპირო ზონის ხმელეთი ზეირთცემის აქტიური ზემოქმედების არიდან 3500-3600 წლის წინ გამოვიდა. ამ დროიდან დაიწყო სანაპირო ზონის ათვისება მოსახლეობის მიერ.

REFERENCES

1. P. V. Fedorov. (1978), Pleistotsen Ponto-Kaspiya, M., 118-119 (Russian).
2. Ch. P. Janelidze. (1980), Paleografiya Gruzii v golotsene. Tbilisi, 53-54 (Russian).
3. P. A. Kaplin, A. O. Selivanov. (1999), Izmeneniya urovnya morei Rossii i razvitiye beregov, M., 186-187 (Russian).
4. R. Papuashvili, N. Papuashvili. (2005), Kolkhetis dzveli namosakhlarebi. Ergeta, Tbilisi, 20-21 (Georgian).
5. L. N. Solov'ev. (1950), Sovetskaya arkheologiya, XIV, 46-48 (Russian).

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