Dziguta

Dziguta, described as a buried peat bog, is situated 5 kilometres south-east of Sukhumi, in Abkhazia. It is south-west of the village of Akhali Sopeli, in the foothills of the Great Caucasus mountains at a height of 115-120 metres above sea level. The peat bog is in the bed of a small stream on a terrace of the river Dziguta, in Pliocene conglomerates. The site was first located in 1936 by the archaeologist L.N. Soloviev, and its scientific investigation commenced in 1966. The dates have been reported by Kh.A. Arslanov and the palynogical analysis has been carried out by N.A. Gei (of the then Leningrad State University). Additional studies of the macrobotanical remains have been undertaken by F.Yu. Velichkevich and I.A. Shilkina. The two reports which are to hand at the moment are by Arslanov, Gei, and Soloviev (1976) and by Arslanov and Gei (1987). There are obvious differences between the two reports, in particular the depth of deposit recorded has much increased between 1976 and 1987, and further information would be desirable.

Nonetheless the reports are not contradictory. The present day natural vegetation of the area (only fragments of which remain due to agricultural activities) is described as woodland of Kolkhid type, with predominant oak, beech, and hornbeam, as well as evergreen shrubs and lianas. The riverside areas contain alder, elm, hazel, and Pterocarya. The Pleistocene and early Holocene vegetation always indicates a climate either somewhat or considerably colder than this.

<u>Arslanov et al., 1976</u>

An approximately 2.40 metre thick section on the right bank of the stream was described as follows (Arslanov et al., 1976: 126).

1. present day soil horizon. 0.2 m thick.
2. grey-brown sandy loam with large unweathered rubble inclusions. 1.0 m thick.
3. dark-brown peat, slightly silty, cut through by narrow cracks (5-10 mm) filled with material from the layer above, and with small fragments of wood. 1.6-1.7 m thick It is emphasised that there are no signs of interruption in the formation of the peat bog. Below the peat there was a compressed mass of vegetation with remains of tree trunks and branches.

12 pollen samples were studied by N.A. Gei through a 1.20 m thickness of the peat deposit. The material was well preserved. From the bottom up, three pollen and spore complexes were discerned (shown on right hand of diagram).

I. 2.40-2.05 m. Predominant spores (48-68%) and arboreal pollen (25-46%), with predominant Alnus (41-69%) and Abies (15-44%). Pinus and Picea in small quantities. Deciduous species always present (6-26%). NAP 1-7%, predominant Polypodiaceae. In general at this time, there was a wide diffusion of beech and fir woods with some spruce. In boggy and wetter areas alder was predominant. On the whole, this was a relatively warm and damp climate.

Velichkevich, on the basis of coniferous needles, nuts, fruits, seeds, and pips, was able to identify the following species from remains found at a depth of 2.20-2.40 m.

Abies nordmanniana (Stev.) Spach, Scirpus sylvaticus L., Alnus sp., Moehringia trinervia (L.) Clairv., Rubus aff. idaeus L., Potentilla sp., Viola sp., Hypericum sp., Lycopus sp., Ajuga reptans L., Mentha sp., Solanaceae gen., Sambucus cf. racemosa L.

II. 2.05-1.35 m. Spores at first predominant but they decrease from 63 to 30% and there is a corresponding increase in arboreal pollen up to 57-67%. Abies increases (50-60%) but Alnus is still significant (22-37%). A few Pinus and Picea; note Betula (1-2%). Deciduous species sporadic, only Fagus shows a continuous curve (1-5%). Total deciduous not more than 7%. NAP low, predominant Polypodiaceae. In general, this is now a fir and spruce woodland, still with a significant alder component. Damp as before but colder.

Velichkevich was able to identify the following species from remains found at a depth of 1.4-1.6 m. Abies nordmanniana (Stev.) Spach, Urtica dioica L., Solanaceae gen., Sambucus cf. racemosa L.

III. 1.35-1.25 m. Arboreal pollen generally predominant (71-74%), Abies down to 2%, a big increase in Pinus (57-71%). Some deciduous species disappear completely (Carpinus, Quercus, Tilia), others are present only at a depth of 1.30 m (Fagus, Ulmus). NAP scarce, predominant Polypodiaceae. This indicates a further cooling and decrease of humidity, with the disappearance of dark coniferous woods and the spread of pine woods. Alder still occurs on damp lowlands. In general, the lowering of the vegetation belts at this time led to the disappearance of mixed woodlands of Kolkhid type.

Fragments of trunks and branches were extracted from the peat at a depth of 1.6-2.4 m. Shilkina identified 14, of which 11 belong to Abies sp. and 3 to Alnus incana L. This is the material that was used to obtain the second and third of the three radiocarbon dates quoted, as follows. They are considered reliable.

1.25 m depth 35,470 $\pm$ 590 BP (LU-545)
1.50 m depth 38,580 $\pm$ 920 BP (LU-378)
2.40 m depth 41,610 $\pm$ 760 BP (LU-376)

(These dates would therefore correspond to complexes III, II, and I, respectively). According to Arslanov and Gei (1987) a further date was obtained from the top of the section in 1976 as follows: 37,800 $\pm$ 1200 BP (LG-88). The stratigraphic position corresponds to the first of the dates listed above.

In general the conclusion was drawn that this was a Middle Würm climate significantly colder than that of the present. Such warming as there was, was interstadial in character. Beech-fir-spruce woods now extend from a height of 800 m above sea level to the boundary with the Alpine meadow zone at 1200-1900 m. The Dziguta peat bog has no known analogies in the Caucasus, but can be compared to Tenaghi Phillipon (Greece) and Padul (Spain).

Arslanov and Gei, 1987

A bigger section and an increased number of samples as well as a much longer

time scale was reported at this time. Over a 16 metre length, six bore holes and/or test pits have been put down (to a maximum depth of 15 metres), and a 1.5 metre long section has been cleaned back. The relationship of this section to the one described earlier has not been specified. As a result, an 11 metre thick biogenic deposit has been revealed, with peat and sapropel, as well as lenses of clay and sand. 240 pollen samples were taken, at 10-20 cm intervals, and there are now 23 radiocarbon dates. Only some of these are quoted in the report. The time period covered now includes both the Middle and the Late Würm, with six identified warm episodes separated by cooler intervals. The sequence from bottom to top is described as follows.

Warm period 1. 47,320 ± 1050 BP (LU-601) to 42,760 ± 660 BP (LU-647A). The warm periods in general are marked by the predominance of lowland deciduous woods (alder, beech, hornbeam, elm) with some fir.

Colder interval. Mainly dark coniferous woods with spruce, signifying a lowering of the vegetation belts. The colder periods in general did not signify the total disappearance of deciduous woods, since these survived in refugia.

Warm period 2. 41,200 ± 710 BP (LU-648) to 38,280 ± 240 BP (LU-599).

Colder interval. Pine woods, with Alnus glutinosa in the wetter areas, cold and damp. The date 35,470 ± 590 BP (LU-545) is attributed to this phase, so that provides a correlation with the results earlier reported.

Warm period 3. 31,650 ± 240 BP (LU-1002) to 28,500 ± 940 BP (LU-1156).

Colder interval. The coldest period of all. 20,560 ± 880 BP (LU-1108) marks the peak. Predominant pine woods, more arid, with an important NAP component, mainly Cyperaceae, plus Artemisia, Chenopodiaceae, and varia.

Warm period 4. Transition to Late Würm. 13,880 ± 100 BP (LU-547) to 12,370 ± 130 BP (LU-1157) or 12,080 ± 40 BP (LU-1000). Beech and fir woods, with some hornbeam. Interrupted by a slight cooling episode at 12,990 ± 160 BP (LU-1154), with an increase in pine woods and some birch.

Colder interval.

Warm period 5. 11,660 ± 80 BP (LU-539) to 11,220 ± 100 BP (LU-540). Some beech and fir, Alnus glutinosa.

Colder interval.

Warm period 6. Holocene. Began 9590 ± 110 BP (LU-1107). Pine and fir woods, still colder than present conditions.

The reference given for the above scheme is Arslanov et al., in Ivanova and Kind ed., 1980, so presumably we will know more about it from that, and hopefully there will be a pollen diagram.

Comments on the above in relation to Levkovskaya's diagram

The upper part of Levkovskaya's diagram relates to Akhshtyr. The top of the sequence at Dziguta has apparently been cut off. Some of the radiocarbon dates have problems.

38,580 ± 920 is at depth 2.0 metres, not 1.5 m as mentioned by Arslanov et al. In the text it appears (wrongly) as 38,000 ± 240.

41,200 ± 710 (not 210)

42,700 ± 560 presumably should be 42,760 ± 660

41,710 ± 740 and 44,630 ± 630 are not in the texts we have. The lab numbers are needed.

References

Arslanov, Kh.A., N.A. Gei, B.L. Soloviev. (1976). The palaeogeography and geochronology of the Late Pleistocene in Abkhazia. (in Russian). *Izvestiya Akademii Nauk SSSR, seriya geologicheskaya*, 6, 125-129.

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