

A short review of the Younger Dryas in the Eastern Mediterranean area (extended abstract)

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Introduction

The Younger Dryas, defined in NW Europe by a characteristic pollen zone, is more difficult to trace in pollen sequences of the Eastern Mediterranean or the Near East. The presence or absence of this period in the form of a pollen zone and/or chrono-zone will be discussed for the area between northern Greece in the west, and the Iranian plateau in the east. It covers Turkey and, more to the south, the Levantine coastal area down to northern Israel and the Euphrates valley down to the border of Syria and Iraq (Fig. 1).

The Quaternary vegetation history of this area is relatively well studied from about 50 pollen diagrams. However, only 17 sites have a pollen record that includes the Late Glacial period. Only part of these sites display a pollen zone that fits the description of the European Younger Dryas and indeed is dated to that period. Diagrams from other sites so far do not show a pollen sequence that allows a Younger Dryas zonation.

Description

The 17 coring locations are divided into six groups on the basis of palynological characteristics. Their geographical distribution is sketched in Fig. 1. For each group a simplified pollen diagram is given as an example (Figs. 2A–F).

Group 1. A diagram from Ioannina (Fig. 2A; Bottema 1974), west of the Pindus mountains, does not clearly indicate a pollen assemblage that can be ascribed to the Younger Dryas. Arboreal pollen (AP) values before, during and after a possible Younger Dryas period do not significantly change. The composition of the tree taxa, however, does change and



Fig. 1. Map of the Eastern Mediterranean–Near East area showing six groups of related Younger Dryas pollen sites discussed in the text. 2. Ioannina (Fig 2A); 3. Xinias; 4. Khimaditis; 5. Edessa; 6. Yenişehir; 7. Abant (Fig 2B); 8. Yeniçağa; 9. Lâdik; 10. Söğüt (Fig 2C); 11. Beyşehir; 12. Konya; 13. Ghab (Fig 2D); 14. Hula (Fig 2E); 15. Van; 16. Urmia; 17. Zeribar (Fig 2F).

pollen values of herbs are reduced after the Younger Dryas.

Group 2. The diagrams from northern Greece and northern Turkey display a Younger Dryas period which bears a definite resemblance to that of Europe (Fig. 2B; Van Zeist & Bottema 1991). The zone, defined as Younger Dryas by means of radiocarbon dates, has high herb values, mainly from steppe taxa, and low tree pollen counts. The zone is preceded by relatively higher tree pollen values and, at its transition to the Holocene, a steep increase in tree pollen is recorded.

Group 3. A retarded increase of AP values at the beginning of the Holocene is found in the Pisidian lake district (Fig. 2C). The delay is in the order of a thousand years and the values do not rise steeply

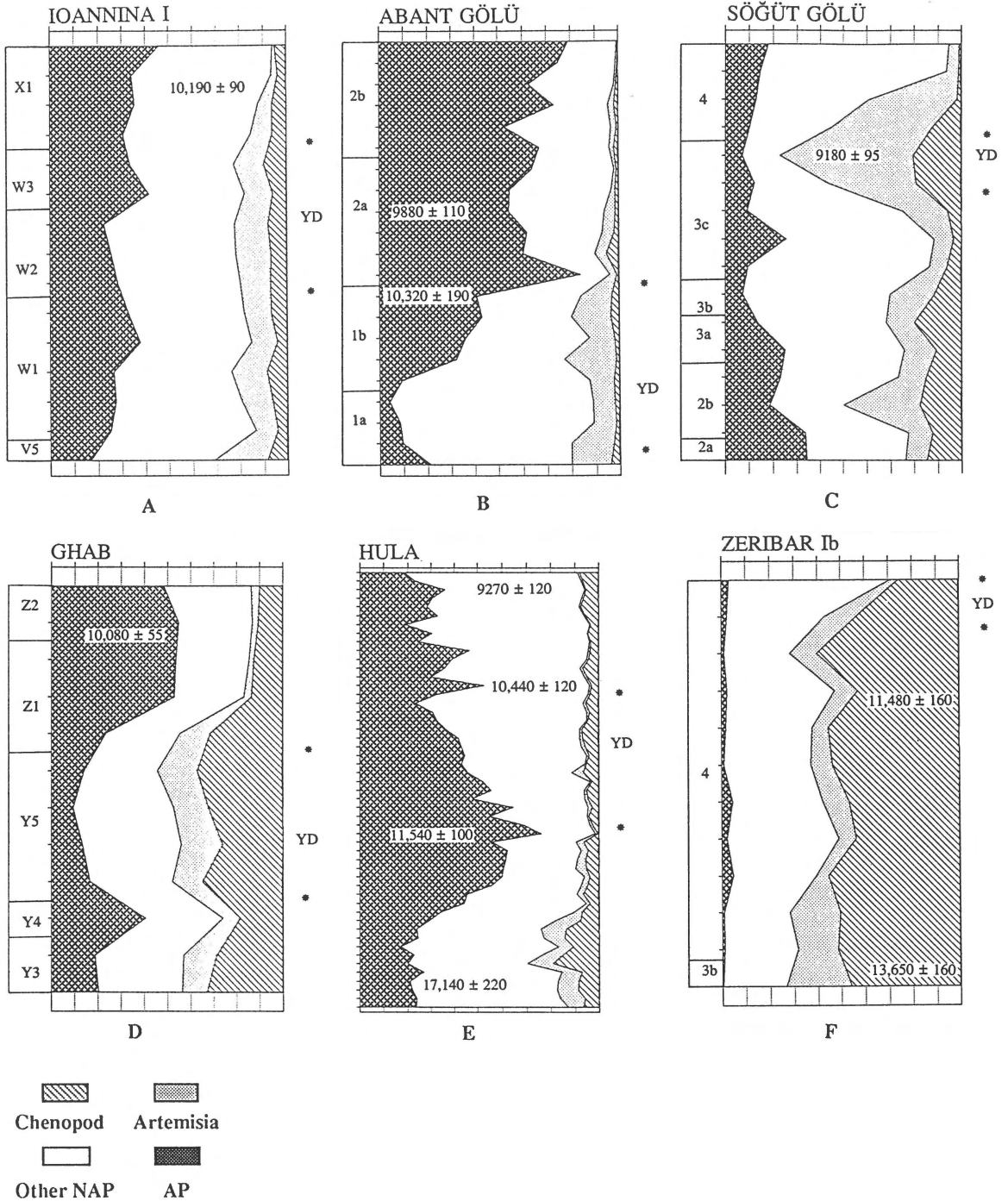


Fig. 2. Parts of simplified pollen diagrams showing AP (arboreal pollen) and NAP (non-arboreal pollen) values, and *Artemisia* and *Chenopodiaceae* forming part of the latter. Top bar represents 100%. For locations see Fig. 1. * YD * = Younger Dryas interval. Radiocarbon dates are in years BP. Zonations are as in sources referred to in the text.

afterwards. The presence of the Younger Dryas period in such pollen diagrams is established only on the basis of radiocarbon dates.

Group 4. In eastern Turkey and northwestern Iran the evolution from forest to modern conditions is even less pronounced (Fig. 2F; Bottema, 1986; Van Zeist

& Bottema 1977; Van Zeist & Woldring 1978). The Younger Dryas is reasonably closely defined by radiocarbon dates. Pollen of steppe taxa characterize the Late Glacial period and are replaced by grass pollen afterwards.

Group 5. In northwestern Syria a pollen diagram is available from the Ghab valley (Fig. 2D). The zone with the highest herb pollen values of the last 50 000 years is inferred to be the Younger Dryas on the basis of a radiocarbon date above this zone. The herb pollen represent taxa of steppe vegetation (Niklewski & Van Zeist 1970).

Group 6. From the Hula marsh in northern Israel a detailed diagram is available (Fig. 2E; Baruch & Bottema 1991). The highest tree pollen values of the last 17 000 years are found from about 14500 to 11500 BP. At the latter date, the beginning of the Younger Dryas, a sharp decrease in tree pollen takes place and the high AP level is never regained.

General remarks

A Younger Dryas phase represented by characteristic pollen assemblages is found in Greece northeast of the Pindus mountains and in northern Turkey. In the only location west of the Pindus, near Ioannina, no clear changes can be detected. The vegetational and climatic development of the southern and eastern part of the area treated here shows marked differences. Modern vegetation, or in fact suitable moisture conditions, either developed relatively late, till 5500 BP, or such conditions already appeared before the Late Glacial. Conspicuous chronological differences between the Hula and the Ghab records cannot easily be explained simply by the hard-water effect on radiocarbon dates, because the pollen curves cannot be correlated.

Conclusions

It is concluded that the pollen zones of the European

Younger Dryas can be found in those parts of the Eastern Mediterranean and the Near East that have a vegetation resembling that of central Europe. Southern Anatolia, which nowadays carries an Oro-Mediterranean to Xero-Euxinian vegetation, shows retarded forest development compared to northern Anatolia and this is felt more strongly in eastern Anatolia and northwestern Iran. In these parts a Younger Dryas period has to be defined primarily by absolute dating. A Younger Dryas pollen zone, if present, must be distinguished on the basis of the pollen of upland steppe plants.

The palynological evidence of the Levant clearly deviates from that of the more northerly areas. In northern Israel the most favourable climatic conditions for tree growth occurred before 11 500 BP, while in northwestern Syria this took place after 10 500 BP. If a Younger Dryas signal was globally present at all, it seems to have been overruled by strong regional patterns in part of the Near East.

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