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Dominance level of the species Punctum pygmaeum (Draparnaud, 1801) a biostratigraphical and paleoecological key level for the Hungarian loess sediments of the Upper Würm -

A Punctum pygmaeum (Draparnaud, 1801) faj dominanciaszintje: a magyarországi felső-würm löszös üledékek biosztratógráfiai és paleoökológiai vezetősíntje

ABSTRACT: The species Punctum pygmaeum is generally found occurring sporadically in the Hungarian loess sediments. In the past few years, however, its mass occurrence (10-75%) was observed in some loess outcrops of the Northern parts of Transdanubia and Danube-Tisza Interfluvial region. The dominance level of Punctum pygmaeum can be established, taking into consideration the accompanying elements of the fauna, which lived in a relatively mild and humid climatic period, parallel to the spreading of arboreal-bushy vegetation. This specific phase can be dated, on the basis of C-14 dates and archaeological evidence, to the interval between 16.000-18.000 BP, within the Upper Würm period.

The species Punctum pygmaeum is a faunal element with characteristic Holarctic distribution. It is generally distributed over Central and Western Europe. Towards the North, it is found up to latitude 71°, on the Scandinavian Peninsula. It can be found at Iceland as well. Eastwards its area extends, through Southern Siberia, Kamchatka, Alaska and Canada, and the southern

parts of the United States as well. Towards the South, the species occurs through the Crimean Peninsula, the Transcaucasus, to Northern Iran and Algeria as well (EHRMANN 1933, KERNEY et al. 1983, SOÓS 1943). In the Alpes, it is found up to an altitude of 2.770 m a.s.l. (KLEMM 1974).

It is generally found living in humid, shady places, forests, forrest limits, under fallen leaves and mouldering wood (KERNEY et al. 1983, LOŽEK 1964, SOÓS 1943).

According to LOŽEK (1964), Punctum pygmaeum played the rôle of a mesophilous element during the Pleistocene, and it had appeared only locally in the loess.

According to ROTARIDES (1931), it is rare in the loess faunas. As a result of modern collection techniques (sifting) and data obtained from the Quaternary Malacological Collection of the Hungarian Geological Survey, the species Punctum pygmaeum turned out to be, though not frequent, at least fairly widely distributed in the loess sediments.

Investigations of the last few years have demonstrated that in certain layers of the Hungarian loess, especially in the Northern parts of Transdanubia and the Danube-Tisza interfluvial region, this species can occur in masses (KROLOPP 1983a, 1983b, 1989, 1991, MOLNÁR-GEIGER 1981, MOLNÁR-KROLOPP 1978, SÚMEGI 1988, SÚMEGI-LÓKI 1990, SÚMEGI et al. 1990 as well as unpublished data). The dominance of Punctum pygmaeum at these sites (Fig. 1.) vary in certain levels from 10% to 76%. This phase was found always in a fairly distinct part of the sequence, because the dominance level in the underlying and overlying layers suddenly decreases, reaching, at the most, a small percentage, or even totally missing from the fauna.

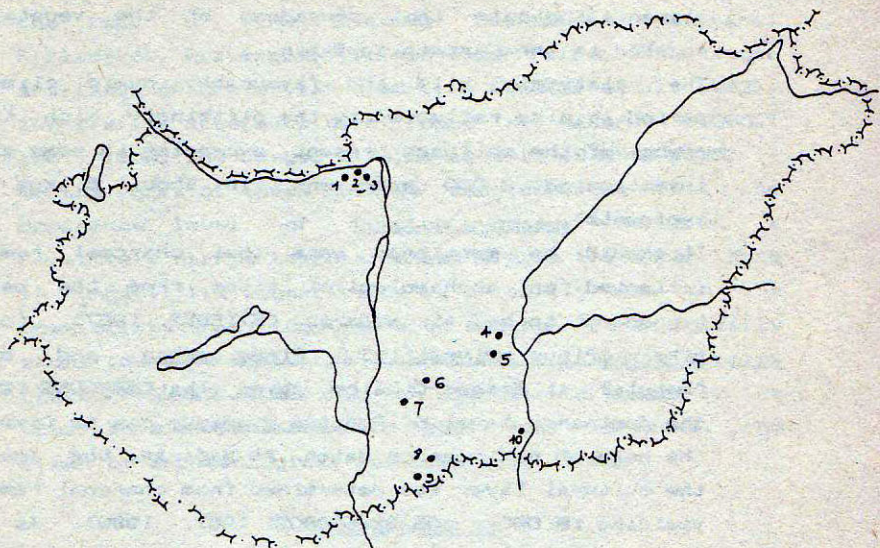


Fig. 1. Localities with the mass occurrence of Punctum pygmaeum /DRAP./ in the Upper Pleistocene. A Punctum pygmaeum /DRAP./ tömeges felső-pleisztocén előfordulásának lelőhelyei. 1 = Esztergom - Gyurgyalag, 2 = Basaharc-tető, 3 = Pilismarót - Pálrét, 4 = Lakitelek, 5 = Tiszaalpár, 6 = Kecel, 7 = Császártöltés, 8 = Madaras, 9 = Katymár, 10 = Szeged - Öthalom.

In the dominance level of Punctum pygmaeum at the different localities there are other Mollusean species reflecting a relatively rich vegetation. Among them, the most important species found comprise Clausilia dubia, Vestia turqida, Vitrina pellucida, Semilimax semilimax, Discus rudерatus and Helicigona arbustorum. The joint occurrence of these species can be traced at several localities, which is by no means incidental. In our opinion, this faunal composition within the Upper Würm period denotes a milder, more humid climatic phase.

Under these climatic conditions, the presence of forest elements indicate that spreading of the vegetation started in the Carpathian Basin.

The relatively mild and favourably humid climatic period is also reflected by the strikingly high total number of the molluscs present, exceeding in some cases investigated 2.000 specimens (in about 6 kgs of sediments).

It should be mentioned here that charcoal remains collected on archaeological sites from the period turned out to be, at Madaras (STIEBER 1967), forest pine (Pinus sylvestris), Pinus cembra and birch (Betula); at Szeged-Öthalom, Abies alba (GREGUSS 1936).

The dominance level of Punctum pygmaeum can be fixed by the help of radiocarbon dates. At Madaras, the age of the cultural layer was determined from charcoal remains yielding 18.080 ± 405 BP (DOBOSI 1967, 1989). As the dominance level is above this layer, it is obviously of more recent age, judging from the thickness of the sediment, at about 16.000 years BP. The cultural layer of Esztergom-Gyurgyalag corresponds at the same time to this dominance level, and is dated to 16.160 ± 300 (unpublished data). At the localities Lakitelek, Tiszaalpár, and Szeged-Öthalom the rich Molluscan material served as basis for C-14 analyses. These analyses were performed by HERTELENDI et al. 1987, 1989: Lakitelek 16.680 ± 300 BP. (SÜMEGI et al. 1990), Szeged-Öthalom 16.000 ± 300 BP.

These absolute chronological data indicate that the dominance level of the species Punctum pygmaeum can be dated at the period 16.000-18.000 BP. In the same period, formation of soil took place in Hungary, classified as the Tápiószűly embryonal soil horizon (16.750 ± 400 BP in: HAHN 1977), and the lower humic level of the Dunaújváros-Tápiószűly loess complex (PÉCSI et al. 1977).

The dominance level of the Punctum pygmaeum is in parts connected to archaeological sites. Thus the sites at the feet of the Dunazug Mountains (Basaharc, Pilismarót, Esztergom) yielded Upper Palaeolithic stone artifacts of Gravettian tradition (DOBOSI et al. 1983), and similar artefacts were found at Madaras (DOBOSI 1967, 1989) and Szeged-Óthalom as well (BANNER 1936). On the basis of these data we can conclude that the dominance level of Punctum pygmaeum occupied a relatively narrow temporal phase within the Upper Würm in Hungary. Its significance is primarily seen in the possibility that, together with another chronologically significant Molluscan species, Vestia turcica (KROLOPP-SÜMEGI 1990), we can demonstrate phases in the Upper Würm in parallel with fossil soil horizons, and fixed by archaeological and botanical finds.

ÖSSZEFOGLALÁS

A Punctum pygmaeum a magyarországi löszös üledékekben általában szórványosan fordul elő. Az utóbbi évek során azonban a Dunántúl északi részén és a Duna-Tisza között egyes löszfeltárásokban tömeges előfordulását észleltük. A Punctum pygmaeum (10-76%) dominanciaszintje a kísérőfauna alapján viszonylag enyhe és kedvező csapadékeloszlású klímazakaszban, a fás-bokros vegetáció térhódításával párhuzamosan jött létre. Ez a szint az ősrégészeti és a C-14 adatok alapján a felső-Würmön belül 16-18.000 BP év közti időintervallumban rögzíthető.

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