

***Vertigo modesta* (Say), *Vertigo geyeri* (Lindholm, 1925)
and *Vertigo genesii* (Gredler, 1856) species in Pleistocene
formations of Hungary***

E. Krolopp–P. Sümegei

Abstract: As one of the results of a revision made on the Pleistocene *Vertigo* material of Hungarian Pleistocene formations this paper presents the survey of 3 species, so far unpublished or questionable. *Vertigo modesta* (Say) had come to light in 1992 from an Upper Würm loess in the Great Hungarian Plain. So far only one locality of it is known. *Vertigo geyeri* (Lindholm) is proved to be a characteristic fauna element of those sediments in the Great Hungarian Plain which had been deposited in a humid environment, in inundation areas of high carbonate content („infusion loess”). *Vertigo genesii* Gredler is a rare species, its separation from small specimens of *Vertigo parcedentata* (Braun) on the basis of morphological criteria of the shell is uncertain, therefore it needs further investigations.

During a revision of the Hungarian Pleistocene *Vertigo* material and of a study of the material of collections recently made (Krolopp, E.–Sümegei, P. 1992 a, 1992 b) we found three species which up to now have not been published from our Pleistocene formations or the correctness of data on them were questionable because of taxonomic problems. Since these species today do not occur in the territory of Hungary (Pintér, L. et al. 1979) their Pleistocene occurrence is important both from stratigraphic and of paleoecological viewpoints.

1. *Vertigo modesta* (Say, 1824)

Fig. 1. a–b.

The species has a holarctic, circumpolar, in Europe arctic-alpine distribution (Kerney, M.P. et al., 1983, Waldén, H. 1966). Its occurrence nearest to our region is in the Tatra Mts., where it lives at an altitude of 1900–2150 m (Ložek, V. 1964). In European literature it (recorded by the name *Vertigo arctica*) (Wallenberg, 1858); its identification with the American species described earlier is more recent. The form *V. tatrica*, too described by Hazay presumably belongs to here.

It is a hygrophilous species, living in shaded places in limestone mountains, in subarctic woodlands in Scandinavia, below rocks and broken plant fragments.

It is recorded from European Quaternary formations only from a few places (Ložek, V. 1964, Petrbok, J. 1959). From our Pleistocene it came to light up to now only one locality; from the loess outcrop of Óthalom which belongs to the town Szeged. It was found in 1991. Though the detailed investigation of the locality has not finished yet, it already seems to be certain, that this sequence of terrestrial loess had been formed in the Upper part of the Würm, between 25 and 16 000 years. *V. modesta* occurs in the lower level of the sequence. In its accessory fauna *Pupilla triplicata*, *P. muscorum*, *Vallonia tenuilabris*, *V. costata* are dominant.

It needs further investigations to explain the occurrence of *Vertigo modesta* in the loess near Szeged. It is highly possible that during the Upper Pleistocene this species had a wider distribution in the Carpathians and along river valleys it had penetrated into the Great Hungarian Plain, too. At any rate it is noteworthy that at Szeged–Óthalom several

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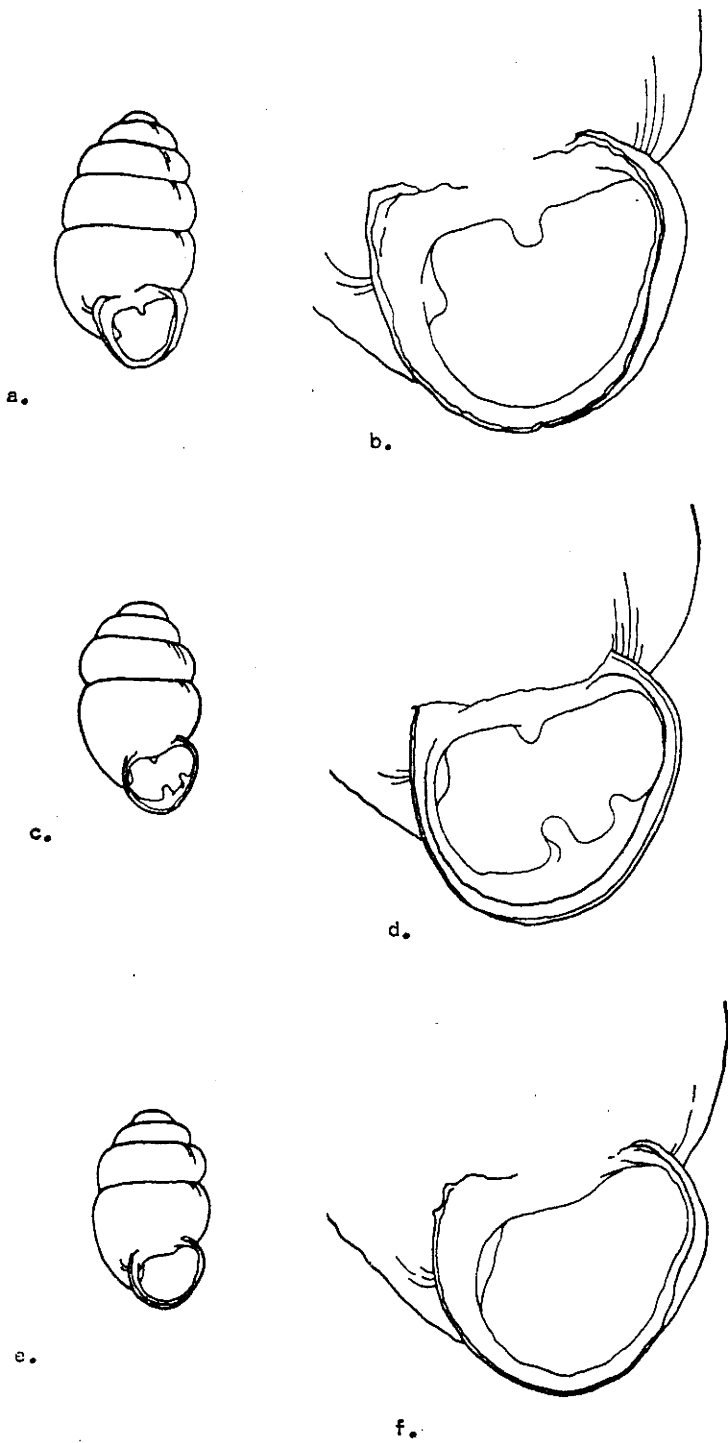


Fig. 1. a, b = *Vertigo modesta* (Say), c, d = *V. geyeri* (Lindholm), e, f = *V. genesii* (Gredler)

2. *Vertigo geyeri* (Lindholm, 1925)

Fig. 1.c-d.

It is a boreoalpine species, with mostly Northern European distribution (Scandinavia, Finland, Lithuania, Latvia, Denmark, sporadically the NE part of Germany and it occurs also in the Alps and in the Northern Carpathians). Its isolated occurrences are recorded from Ireland, Poland and from the S part of Germany (Kerney, M. P. et al, 1983, Licharev, I. M.–Rammelmeyer, E. Sz. 1962, Pokryszko, B. M. 1986, Waldén, H. 1966). In the Alps it penetrates up to an altitude of 1750 m (Klemm, W. 1974).

Vertigo geyeri is a frequently occurring hygrophilous species living in inundation areas rich in carbonates or in swampy-marshy areas.

In the literature it is recorded for the first time in the list of Pleistocene species (Krolopp, E. 1982–83) where it was put into on the basis of the collection material of the Hungarian Geological Institute. From the collections made by P. Sümeği it became known from several places from Upper Pleistocene sediments of the Great Hungarian Plain (Nyilas, I.–Sümeği, P. 1989, Sümeği, P. 1989, Sümeği, P. et al. 1991). During the revision of *Vertigo* material it became clear that this was one of the characteristic fauna elements of sediments deposited in the Great Hungarian Plain in a humid environment, inundation areas of high carbonate content (infusion loess). It is rare in typical eolian loesses.

Up to the present *Vertigo geyeri* is known from 65 localities from Pleistocene sediments in Hungary (Krolopp, E.–Sümeği, P. 1992 b). The majority of the localities belongs to the Upper Pleistocene, 6 sites are recorded from the lower Pleistocene and only 2 ones from the Middle Pleistocene, respectively. The Pleistocene occurrences of the species are restricted almost exclusively to the Great Hungarian Plain and it was widespread especially in the Upper Würm and in the Late Glacial Phases. It had disappeared from our region presumably about 10–11 000 BP years ago. (Sümeği, P. 1991). Its mass occurrence was never recorded, it was found in the samples only as represented by a few specimens so far. Its accessory fauna contains mostly cold resistant hygrophilous species (*Succinea oblonga*, *Cloumella edentula*, *Vertigo substriata*, *V. parcedentata*, *Trichia hispida*).

3. *Vertigo genesii* (Gredler, 1856)

Fig. 1.e-f.

Like the above-mentioned species, this one is also a boreoalpine species, living in Scandinavia, Finland, in the N part of Russia, at some spots in Poland and in some places of Germany and Switzerland (Kerney, M. P. et al, 1983, Licharev, I. M.–Rammelmeyer, E. Sz. 1962, Waldén, H. 1966). Recently it is reported from N. England as well (Coles, B.–Colwille, B. 1980).

According to the above-mentioned data the distribution of *Vertigo genesii* is similar to that of *V. geyeri*, yet it seems that the latter has a distribution with its centre farther in the North than the previous one, besides, in the Alps it penetrates up to a higher altitude (that is till 2000 m), that the other species (Kerney, M. P. et al. 1983). This difference in the distribution of the two species can be attributed to their somewhat different ecology on the basis of which we consider *V. genesii* to be a hygrophilous cold-demanding species while *V. geyeri* to be a cold-resistant hygrophilous one.

A few occurrences of *V. genesii* were published for the first time by Soós (1955–1959), though part of them later proved to be belonging to *V. geyeri*. The first authentic specimen of the species was collected by Pál Sümeği from the Upper Pleistocene (Middle Würm) sediment near Jászfelsőszentgyörgy (Sümeği, P. 1991).

V. genesii have two Lower Pleistocene and 16 Upper Pleistocene occurrences known so far from Pleistocene formations in Hungary. (Krolopp, E.–Sümeği, P. 1992 b) – See

also the remarks below! – In its accessory fauna *Collumella columella*, *Pupilla sterri* and *Vallonia tenuilabris* are the most characteristic species.

We emphasize that on the basis of studies made on the Hungarian Pleistocene *Vertigo* material *Vertigo geyeri* and *V. genesii* species can be distinguished from each other well (Krolopp, E.–Sümegei, P. 1992 a). On the bases of recent European material Waldén (1966) had conceived the opinion. At the same time we do not think the searation of *V. genesii* and *V. parcedentata* made on the basis of shell morpholgoy to be solid. Smaller specimens of *V. parcedentata* are highly similar to the specimens of *V. genesii*; their separation is frequently uncertain. We have to take into account also the great variety of forms experienced among the Pleistocene populations of *V. parcedentata* a phenomenon, referread earlier also by Waldén (1966). We do not think impossible either that the form called *V. genesii* covers, in fact, those specimens of *V. parcedentata* which, influenced by unfavourable ecological conditions, became sexually mature before the growth of their shells had been completed.

Remarks on the two species:

Vertigo geyeri was earlier considered to be sub-species of *V. genesii* and was designated as *V. genesii geyeri*. (Lindholm, 1925; Lozek, V. 1964). It is partly due to this that part of the data on *V. genesii* published in earler literature, in fact, concerns *V. geyeri*. Therefore E. Krolopp's publications, too (Krolopp, E. 1982–83, 1984, Krolopp, E.–Szónoky, M. 1984) should be interpreted in this manner.

All the three *Vertigo* species which already do not exist in the territory of Hungary had been osuted north wards from our region because of changes took place in ecological conditions at the end of the Pleistocene and at the beginning of the Holocene or they retreated to high mountains. Their Pleistocene distribution in Hungary, based o nthe UTM grid, is represented on Fig. 2.

Összefoglalás

A magyarországi pleisztocén *Vertigo* anyag revíziója és az újabb gyűjtések feldolgozása során 3, korábban hnm közölt, illetve nem bizonyított faj előfordulását sikerült igazolni. A *Vertigo modesta* (Say) eddigi egyetlen, felső-pleisztocén előfordulása Szeged-Óthalom löszfeltárása. A *Vertigo geyeri* (Lindholm) és *Vertigo genesii* (Gredler) fajok is főleg felső-pleisztocén üledékekből ismeretesek. Mindkettő higrofil faj, de hőmérsékleti igényük kissé eltérő. A *Vertigo genesii*-nek a *Vertigo parcedentata* (A. Braun) fajtól héj alapján történő elkülönítését a magyarországi pelisztocén anyag vizsgálata nyomán kétségesnek tartjuk. A *Vertigo genesii* néven szereplő pleisztocén alak faji önállóságának kérdése ezért további kutatásokat igényel.

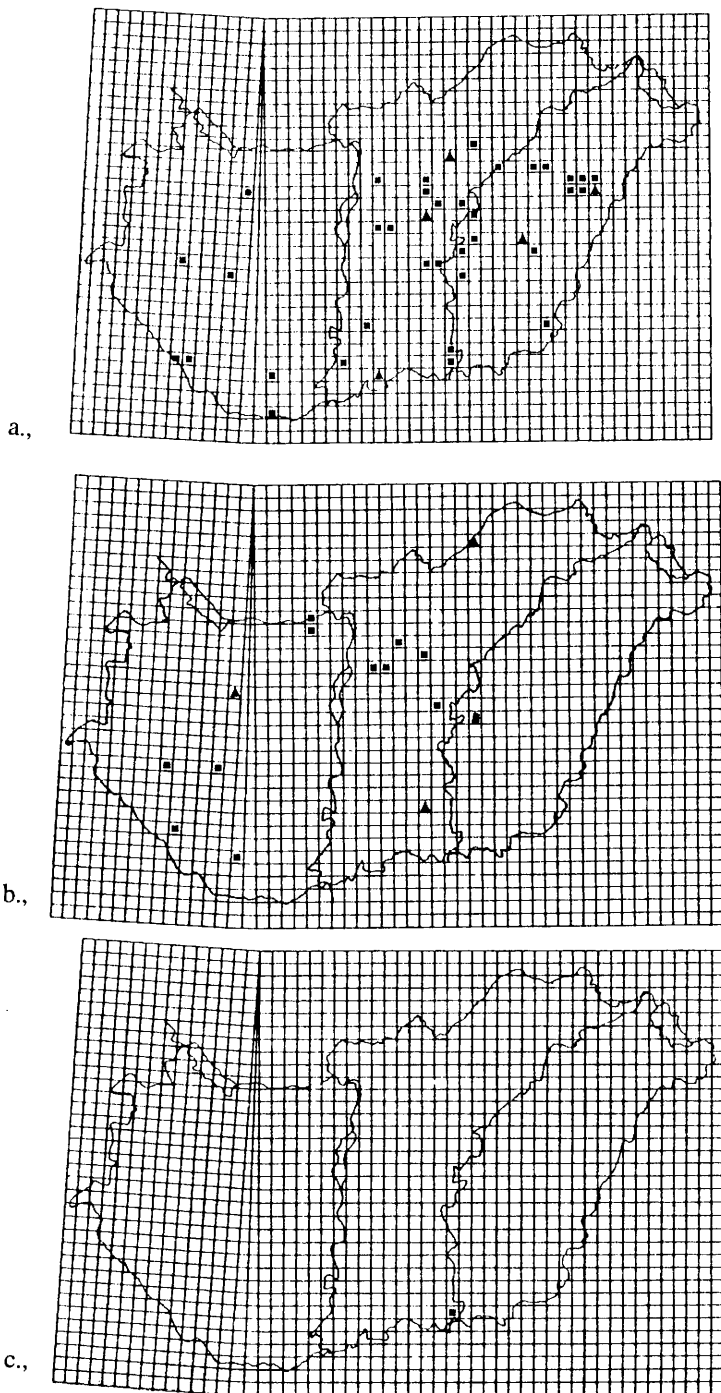


Fig. 2. Pleistocene localities of *Vertigo geyeri* (a), *V. genesii* (b) and *V. modesta* (c) in Hungary.
 black square = Upper Pleistocene localities black circle = Lower Pleistocene localities
 black triangle = Middle Pleistocene localities

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KROLOPP Endre
Magyar Állami Földtani Intézet
Budapest, Stefánia ut 14.
H-1143

SÜMEGI Pál
KLTE Ásvány- és Földtani Tanszék
Debrecen, Egyetem tér 1.
H-4010