

**Abstract** — In Ostrava-Muglinov has been found nuts of the fossil *Trapa* in the pleistocene stratum from the Mindel-Riss interglacial. For their small sizes the autor named it *Trapa minuta* nova spec. From the point of view of the shape and size their are nearest related to the tertiary *T. heeri*.

In the loam-pit of brick yard in Ostrava-Muglinov there has been found the interglacial flora with nuts of the genus *Trapa* L. (OPRAVIL 1964). Bog deposits filled in a not large extent the flat depression of the surface of a gravel-sandy river terrace, the sedimentation of which took place in the cataglacial phase of the Mindel glaciation (MACOUN 1962). The overlying stratum of the bog and of the gravel terrace consists of strata of loamy sandy deposits with the buried soil complex of Muglinov of the Praeriss stadial. A layer of boulder loam, glacilacustrine sand and varves of the Riss glaciation and Würm loess loam rests on this overlying stratum. The exploitation of the overlying stratum caused the successive exposure of the whole low bog, consisting of the series of strata of clays sand, mudds and peat. The discovered flora reaches the period of the coolong of the climate: in the warmer I. phase a series of more thermophilous plants occurs (*Trapa, Aldrovanda vesiculosa, Potamogeton trichoides* etc.); in the cooler II. phase the cool-climate vegetation with *Paludella squarrosa* and *Pinus cembra* predominantes (OPRAVIL l. c.).

Across the low bog there has been carried out an excavation and samples of the macroremnants were collected along it. In the bed of the mudds, the sedimentation of which took place in the warmer phase, the nuts of the genus *Trapa*-fragments, horns and whole nuts were found. The small dimensions were striking at all these and they reminded even by their shape the tertiary types, according to my preliminary report (OPRAVIL 1962). These nuts can be identified neither with any living species, nor with the descriptions of the fossil pleistocene and tertiary finds, published up to this time. That's why I give in this work the description of the discovered nuts, which I ascribe to a new species.

When describing there nuts I had to attend also to a certain disharmony in the terminology used for the specification of the individual parts and forms of the nuts. In the diagnoses of the different authors many differences in the English and Latin terms can be found. The detailed schemas and descriptions of nuts of the genus *Trapa* were published in MIKI (1952) and TACIK (1963). Miki's schema introduced also BERGER (1957). There are certain differences between these both schemas and they are not always entirely exhaustive (MIKI l.e.). The observations of MIKI
are based on phylogenetic and ontogenetic knowledge and the morphologic characteristic of the nuts is given in English. The petals by the genus *Hemitrapa* changed after blossom into long and thin horns with prickles. At the genus *Trapa* there are large horns and the median line is not in one plane (the morphology of horns published details Tack I.e.). Besides the changes on sepals certain changes on the coronal scars of stamens and of petals, on the places of which very striking knolls develop take place. In the diagnoses of the authors (for instance Vasilev 1949, Szafer 1954 etc.) differences can be found in the descriptions of the collar etc. My schema of description of the *Trapa* nut is based on that of Miki and I try to choose the most suitable terms after comparison with other authors; for instance from the phylogenetic and even the ontogenetic point of view there is sure to be better to use instead of the term tuberculum the term cicatrix etc. I give together with the Latin and English terminology ever the Czech terms.

Fig. 1. — Diagrammatic representation of nut of the genus *Trapa* L.
1. porus germinativus  germ pore
2. pili hairs
3. corona apicalis apical corona
4. collum collar collar
5. cicatrich staminalis scars of stamens
6. cicatrich petiolaris scars of petals
7. cornua superioa upper horns
   a) brachium humerus
   b) spina spine
   c) mucrones prickles
8. cornua inferiora lower horns
9. linea media median line
10. hilum pedunculi hilum of peduncle
11. tubus calycinus calyx tube

Trapa minuta species nova

Derivatio nominis: drupae minutae vel minimae.

Diagnosis: Drupa quadricornis, 9–12 mm alta, raro altius; 14–22 mm lata. Cornua superioa horizontaliter vel leviter sursum vergentia, basi angusta, desuper leviter compressa, paulatim in spinas transeunt. Cornua inferiora horizontaliter vel fastigate demissa, recta vel curvata, de lateribus leviter compressa. Superficies drupae plana sine profundis; cicatrices staminales globosae dum cylindricae, magnitudinis 1–1,5 mm. Corona pilosa, 3–4 mm lata, collum pariter latum vel angustior; 1,5–2,0 mm latum. Tubus calycinus triangularis.


Nuts 4-horns, 9–12 mm high rarerly greater, 14–22 mm wide. Upper horns horizontally or slightly depressed, gradually overgoing into cusp. Lower horns horizontal or slanting, straight or curved, from side compressed. The surface of nut is flat without hollows; scars of petal are globular to cylindrical, size 1–1.5 mm. Apical corona wide 3–4 mm, collar equal or minor, 1.5 to 2.0 mm high. Calyx tube triangular.

Trapa minuta is very related with their shape to the tertiary Trapa heeri v. FRITSCH (KIRCHHEIMER 1957) from which is he distinguished regularly developed scars of stamens, basal part of nuts is not rounded but sharpened, the bases of the upper horns is thinner (but no so much as by Trapa maximoviczi KORSH). The size of the nuts is perhaps determined with the beginning of the cool climate (GAMS 1958), at all nuts in question small dimensions predominated, the largest nut was 19 mm high. The figures of the individual nuts show, that the deformation of the shapes of some nuts took place due to the pressure of the overlying stratum. Some dimensions could not be measured therefore.

Acknowledgements
1. I am indebted to Professor W. Szafér and Professor A. Środoń for to giving me possibility of studying Polish Trapa-Samples.
2. I am also indebted to Professor Z. Černohorský for valuable advices in this respect.

References
Table of some dimensions of nuts of the species Trapa minuta

<table>
<thead>
<tr>
<th>Distance (without spines)</th>
<th>mm</th>
<th>Distance (with upper horn)</th>
<th>mm</th>
<th>Distance (with lower horn)</th>
<th>mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length one upper horn</td>
<td>8.0</td>
<td>Length one lower horn</td>
<td>7.0</td>
<td>Length of nuts</td>
<td>18.0</td>
</tr>
<tr>
<td>Width of nuts</td>
<td>8.5</td>
<td>Width of collar</td>
<td>2.0</td>
<td>Width of the apical corona</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Explanations of the plates:

Tab. II.: *Trapa minuta* n. sp.: 2. — holotypus; 1., 3.–10. — paratypus.

Tab. III.: *Trapa minuta* n. sp.: i. — holotypus; a–g, j — paratypus.


E. Opravil: *Trapa minuta* nova spec. from the Czechoslovak pleistocene
E. Opravil: *Trapa minuta* nova spec. from the Czechoslovak pleistocene