

Trapa minuta nova spec.
from the Czechoslovak Pleistocene

Emanuel O p r a v i l

Geografický ústav ČSAV, Opava

Received May 28, 1964

A b s t r a c t — 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 burried soil complex of Muglinov of the Praeriss stadial. A layer of boulder loam, glacialacustrine sand and varves of the Riss glaciation and Würm loess loam rests on this overlying stratum. The explotation of the overlying stratum caused the successive exposure of the whole low bog, consisting of the series of strata of clayes 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 species¹).

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 nuts²). 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.c.). 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 TACIK l.c.). 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.

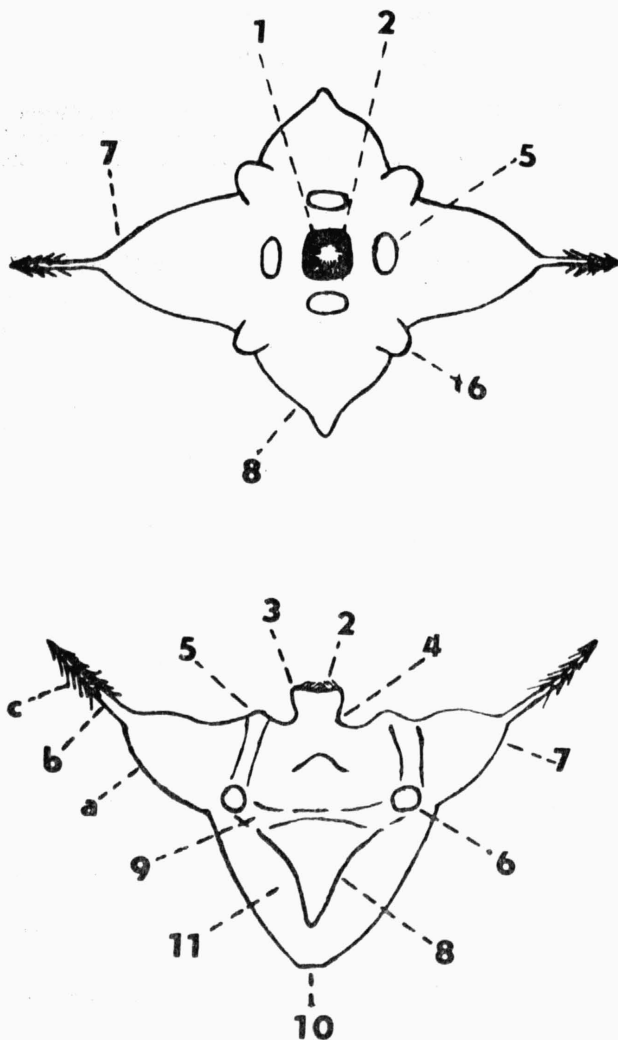


Fig. 1. — Diagrammatic representation of nut of the genus *Trapa* L.

1. porus germinativus	germ pore	klíční otvor
2. pili	hairs	chlupy
3. corona apicalis	apical corona	vrcholová korunka
4. collum collar	collar	krček
5. cicatrix staminalis	scars of stamens	jizvy po tyčinkách
6. cicatrix petiolaris	scars of petals	jizvy po plátcích
7. cornua superiora	upper horns	horní rohy
a) brachium	humerus	rameno
b) spina	spine	trn
c) mucrones	prickles	ostny
8. cornua inferiora	lower horns	dolní rohy
9. linea media	median line	střední čára
10. hilum peduncul	hilum of peduncle	jizva květní stopky
11. tubus calycinus	calyx tube	kališní část pecky

Trapa minuta species nova

Derivatio nominis: drupae minutae vel minimae.

Diagnosis: Drupa quadricornis, 9—12 mm alta, raro altius; 14—22 mm lata. Cornua superiora 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.

Holotypus: Museum Silesiae, Opavia. Tab. II. 2, III. i.

Paratypus: Museum Silesiae, Opavia.

Distributio: Ostrava-Muglinov, in limo detrituoso aetate interglaciale Mindel-Riss.

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 regulary 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 maximowiczii* 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 shoces 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. Szafer and Professor A. Šrodoň 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

- BERGER W. (1957): Eine neue fossile Wassernuss aus den untermiozänen Braunkohlenablagerungen von Langau bei Geras in Niederösterreich. — *Phyton* 7 : 152—158.
GAMS H. (1958): Beitrag zur Variabilität der Früchte von *Trapa natans*. — *Veröffentlichungen des Geobotanischen Institutes Zürich* 33 : 108—115.

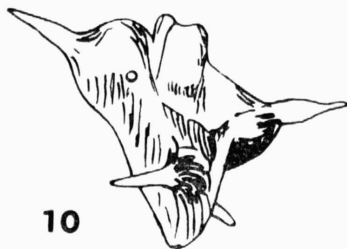
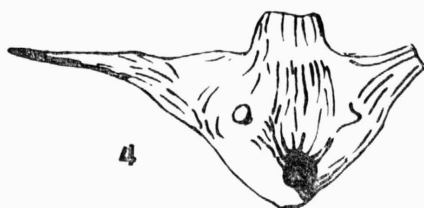
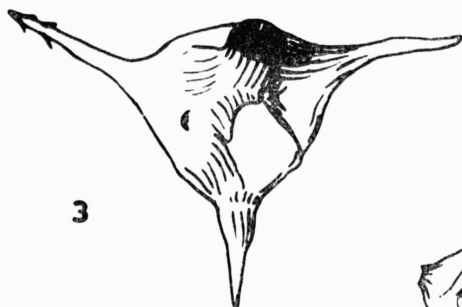
Length of nuts (without spines) — mm	23.0	17.0	19.0	15.0	—	17.0	16.0	21.0	21.5	—	18.0	—	—	23.0
Length one upper horn — mm	6.0	2.0	4.0	3.0	9.0	5.0	5.0	6.0	6.5	7.0	6.0	5.5	6.0	8.0
Length one lower horn — mm	— *	4.0	—	3.2	—	5.0	5.0	4.0	—	—	—	2.4	—	—
High of nuts — mm	19.0	12.0	12.0	12.0	10.5	12.0	10.0	10.0	11.0	14.0	9.0	12.6	—	10.0
Wide of nuts — mm	11.0	—	—	—	—	16.0	—	—	—	7.0	—	10.0	—	—
Wide of collar — mm	1.5	2.0	1.5	1.4	2.4	1.4	2.2	2.0	1.4	1.6	1.2	2.0	1.2	2.0
Wide of the apical corona — mm	4.6	4.0	3.0	1.6	3.4	3.0	3.4	3.5	3.0	2.5	2.6	4.5	2.0	3.5

* The nut is deformed.

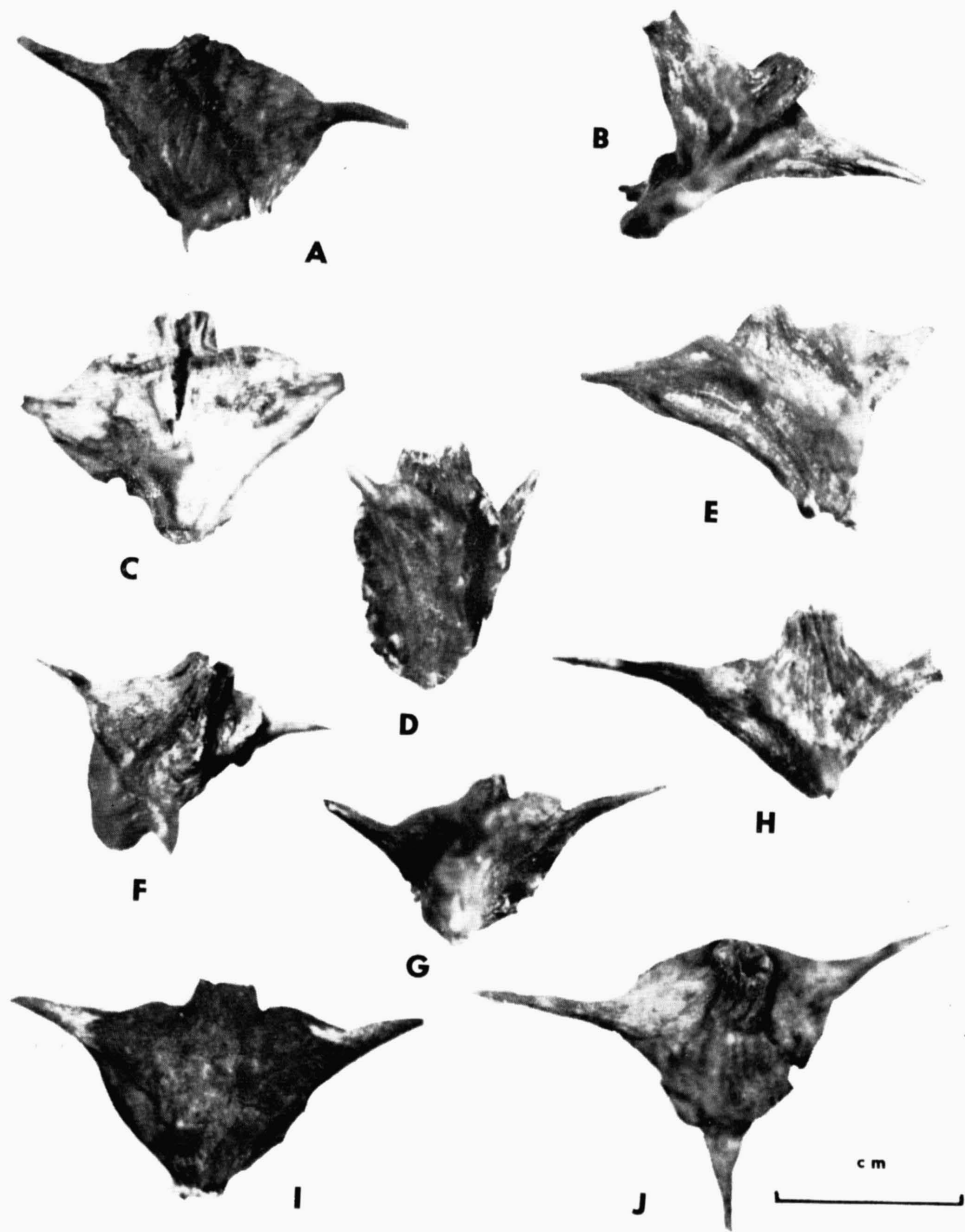
- KIRCHHEIMER F. (1957): Die Laubgewächse der Braunkohlenzeit. 1—783.
- MACOUN J. (1962): Eolické sedimenty a jejich vztah k ostatním kvartérním uloženinám v širší oblasti Ostravska a oderské části Moravské brány. — Disertace, Geofond.
- MIKI S. (1952): Trapa of Japan with special reference to its remains. — J. Inst. Polytechnics Osaka City University, Ser. D, Biology, 3 : 1—29.
- OPRAVIL E. (1962): Kotvice (*Trapa L.*) v ostravském pleistocénu. — Přír. Čas. slezský 23 : 232.
- OPRAVIL E. (1964): Květena mindel-risského interglaciálu z Ostravy-Muglinova. — Acta Mus. Silesiae, Ser. A, 13 : 41—47.
- SZAFER W. (1954): O niektórych żyjących i kopalnych formach orzecha wodnego (*Trapa L.*). — Acta Soc. Bot. Poloniae 23 : 117—141.
- TACIK T. (1963): Hydrocaryaceae (Trapaceae), Kotewkowate, — Flora Polska, Rośliny naczyniowe Polski i ziem ościennych 10 : 14—26.
- VASIL'EV V. N. (1949): Vodjanyje orěchi, Hydrocaryaceae. — Flora SSSR 15 : 637—662.

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