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ECOLOGICAL INTERPRETATION OF THE BEETLE ASSEMBLAGES  
(COLEOPTERA FAUNAL UNITS) FROM THE "KLUKI 74" HOLOCENE  
PROFILE  
PRELIMINARY RESULTS

Interpretacja ekologiczna zgrupowań chrząszczy (*Coleoptera*) z holocenijskiego  
profilu "Kluki 74"  
Wstępne doniesienie

All investigated beetle remains origin from the samples analysed for plant macrofossils (see: pp. 179—222). In few layers of the profile (especially samples between 290 and 390 cm) — a beetle material was lacking. Identified beetle macrofossils are listed in the table 1.

Examined beetle material admits the designation of four "assemblage zones" ("faunal units"), as follows:

I. During the period between ca. 10.000 and 6200 years B. P. (samples: 670—440 cm in the profile) we observe a presence of beetles connected with the shore of a water basin overgrown with *Phragmites communis* and eventually also *Typha* sp. and *Glyceria* sp.; main indicators: carnivorous ground-beetles *Odocantha melanura* and *Agonum pelidnum*, as well as phytophagous long-horned leaf beetle *Plateumaris braccata*. Successional phases:

I-a. Early (initial?) aspect, circa 10.000—8500 years ago — a poor assemblage with carnivorous *Pterostichus brunneus* in the ground stratum, *Gyrinus natator* on the surface of a water basin, and bigger *Dytiscidae* in the water.

I-b. Preculminant phase, circa 8500—7300 years ago — a richer swamp assemblage; beginning of a domination of the phytophagous *Plateumaris sericea* (probably on *Iris pseudoacorus*) on a shore, hygrophilous and humicolous *Coelostoma orbiculare* in littoral mud, and carnivorous *Dytiscidae* in the deep water.

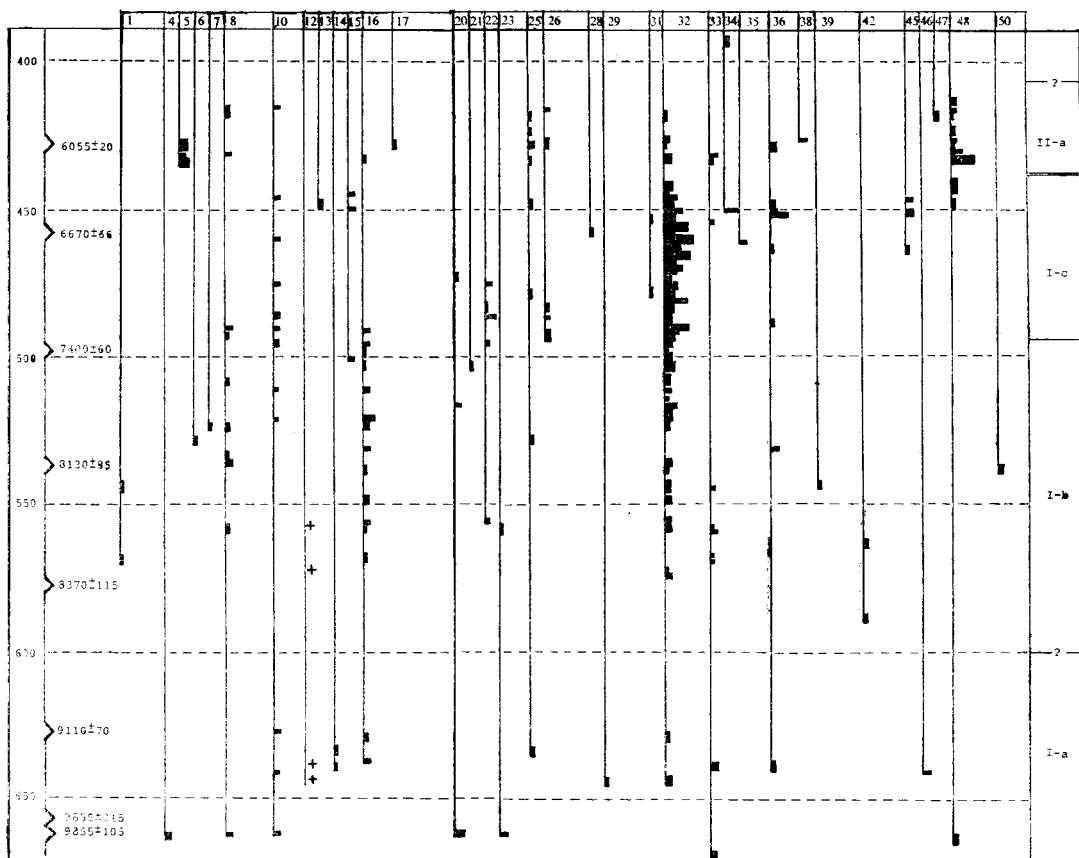
I-c. Shore culminant phase, circa 7300—6200 years ago — with the distinct domination of *Plateumaris sericea*; the ripicolous *Stenus* spp. in the ground stratum and *Dryops auriculatus* in the shallow water.

The above described succession stage was finished about 6200 years ago — probably as a result of the local (?) water transgression.

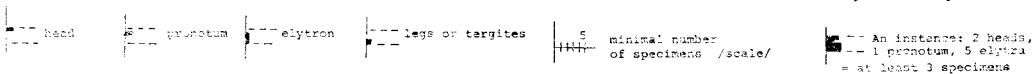
cm	Age	Beetle macrofossils	assemblage zones - faunal units
1		<i>Epaphius rivularis</i> (Gyll.)	
2		<i>Epaphius rivularis</i> (Gyll.)	
3		<i>Epaphius rivularis</i> (Gyll.)	
4		<i>Pterostichus strenuus</i> (Famz.)	
5		<i>Pterostichus strenuus</i> (Famz.)	
6		<i>Dolichus balensis</i> Schall.	
7		<i>Agonum religio</i> Pank.	
8		<i>Pterostichus</i> sp. div.	
9		<i>Acupalpus meridicus</i> (Lin.)	
10		<i>Cadacanthus meridius</i> (Lin.)	
11		<i>scallier</i> , <i>Dytiscidae</i> spp. div.	
12		<i>biggar</i>	
13		<i>Gyrinus marinus</i> Gyll.	
14		<i>Gyrinus maritimus</i> (Lin.)	
15		<i>Gyrinus</i> sp. indet.	
16		<i>Coelostoma orbiculare</i> (Fabr.)	
17		<i>Aethidium sectulum</i> (Lin.)	
18		<i>Silpha atrata</i> Lin.	
19		<i>Omalinus</i> (maidy) <i>oleocharis</i> sp.	
20		<i>Paedicia</i> (Gahan) <i>latidorsum</i>	
21		<i>Stenus bicruciatatus</i> Gyll.	
22		<i>Stenus</i> sp. div.	
23		<i>Staphylinidae</i> spp.	
24		<i>Allochelis</i> sp. indet.	
25		<i>Scirtes orbicularis</i> (Famz.)	
26		<i>Dryops auriculatus</i> (Pomr.)	
27		<i>Lateridae</i> sp. indet.	
28		<i>Donacia</i> (maidy) <i>parva</i>	
29		<i>Donacia</i> (maidy) <i>parva</i>	
30		<i>Donacia tomentosa</i> Ahr.	
31		<i>Donacia</i> sp. indet.	
32		<i>Plateumaris sericea</i> (Lin.)	
33		<i>Plateumaris braccata</i> Scop.	
34		<i>Plateumaris consimilis</i> (Schr.)	
35		<i>Plateumaris rustica</i> (Kunze)	
36		<i>Donacinae</i> spp. div. indet.	
37		<i>Apion</i> (maidy) <i>herbsti</i>	
38		<i>Apion</i> (maidy) <i>herbsti</i>	
39		<i>Apion</i> sp. div. indet.	
40		<i>Hydrophilus</i> (maidy) <i>herbsti</i>	
41		<i>Hydrophilus</i> (maidy) <i>herbsti</i>	
42		<i>Hydrophilus</i> (maidy) <i>herbsti</i>	
43		<i>Hydrophilus</i> (maidy) <i>herbsti</i>	
44		<i>Hydrophilus</i> (maidy) <i>herbsti</i>	
45		<i>Hydrophilus</i> (maidy) <i>herbsti</i>	
46		<i>Hydrophilus</i> (maidy) <i>herbsti</i>	
47		<i>Hydrophilus</i> (maidy) <i>herbsti</i>	
48		<i>Limnobaris pilistriata</i> (Steph.)	
49		<i>Rhinocerus castor</i> (Fabr.)	
50		<i>Microtus epicalus</i> (Gyll.)	
51		<i>Microtus</i> sp. indet.	
		<i>Beetle macrofossils</i>	
		assemblage zones - faunal units	
	250-250		IV
	865-60		III-a
	1355-60		III-b
	1535-60		III-c
	1750-60		III-d
	2120-45		III-e
	200		7
	3865-70		III-a
	250		II-b

II. The next period (circa 6200—3800 years B. P.; samples: 440—250 cm) was characterised by a succession of assemblages of a beetle fauna connected with marshy forest or brushwood; the main indicator: phytophagous *Limnobaris pilistriata*. Successional phases:

II-a. Culminant phase (6200—4500 years ago) of the above mentioned indicator; hygrophilous *Scirtes orbicularis* on herbs and carnivorous *Pterostichus* in the ground stratum — in addition. Regression of species connected with the



Significance of the beetle remains in 5-cm sample:



cane (*Odacantha melanura* and *Plateumaris braccata*) as well as the previously dominant — *Pl. sericea*.

II-b. Postculminant phase (4500—3800 years B. P.) of *Limnobaris pilistriata*, with carnivorous *Epaphius rivularis* in the ground stratum and with small *Dytiscidae* in the water

III. During the period 3800—500 years ago (samples: 250—25 cm) we observe the few successional stages of a shore forest; the main beetle indicator: *Agathidium seminulum* connected with the rotten wood and touchwood. Successional phases:

III-a. Poor initial phase (3800—2500 years B. P.) with a presence of *Coelo-*

*stoma orbiculare*, *Dryops auriculatus*, *Plateumaris rustica* and others (interpretation as below).

III-b. Culminant phase (2500—2000 years B. P.) with numerous species connected with the moist forest and with the open water (the richest assemblage in the investigated profile — 16 identified species in addition to the higher taxa). Saprophagous *Agathidium seminulum* and *Rhyncolus sculpturatus* in a rotten wood; phytophagous *Plateumaris consimilis* and *Pl. rustica* on *Carex* spp., *Apion marchicum* (or allied species?) on *Rumex* sp., and *Ap. vicinum* on *Mentha aquatica*; carnivorous *Epaphius rivularis* and *Pterostichus brunneus* in the ground stratum; *Donacia tomentosa* on *Butomus umbellatus*, and few species of *Bagous* on other aquatics; *Coelostoma orbiculare* and *Dryops auriculatus* in the littoral water and mud; different carnivorous *Dytiscidae* in the deep water.

III-c. Postculminant phase (2000—1000 years B. P.). Regression of the species connected with the open water, and bigger participation of the phytophagous — peat-bog *Donaciinae*; the heath weevil *Micrelus ericae* occurs. Overgrowing of the shore of a shallow (?) basin.

III-d. Poor residual phase (1000—?200 years B. P.) with sporadic *Plateumaris* and *Bagous* specimens.

IV. The present time phase (from about 200 years ago; samples: 25—0 cm). Rather poor assemblage of eurytopic species of beetles connected with the moist forest and meadows: phytophagous *Hypera plantaginis* (living on *Plantago lanceolata* or *Lotus uliginosus*) and *Rhinoncus castor* (living on *Rumex acetosella*), as well as the carnivorous *Epaphius secalis* and *Amara* sp. in the ground stratum. Also a presence of the hygrophilous species (*Coelostoma orbiculare* and *Scirtes orbicularis*) on one hand — and of species connected with open country (*Acupalpus meridianus*) on the other hand.

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