Ductile compressional deformation in the Gerecse Mts, Hungary

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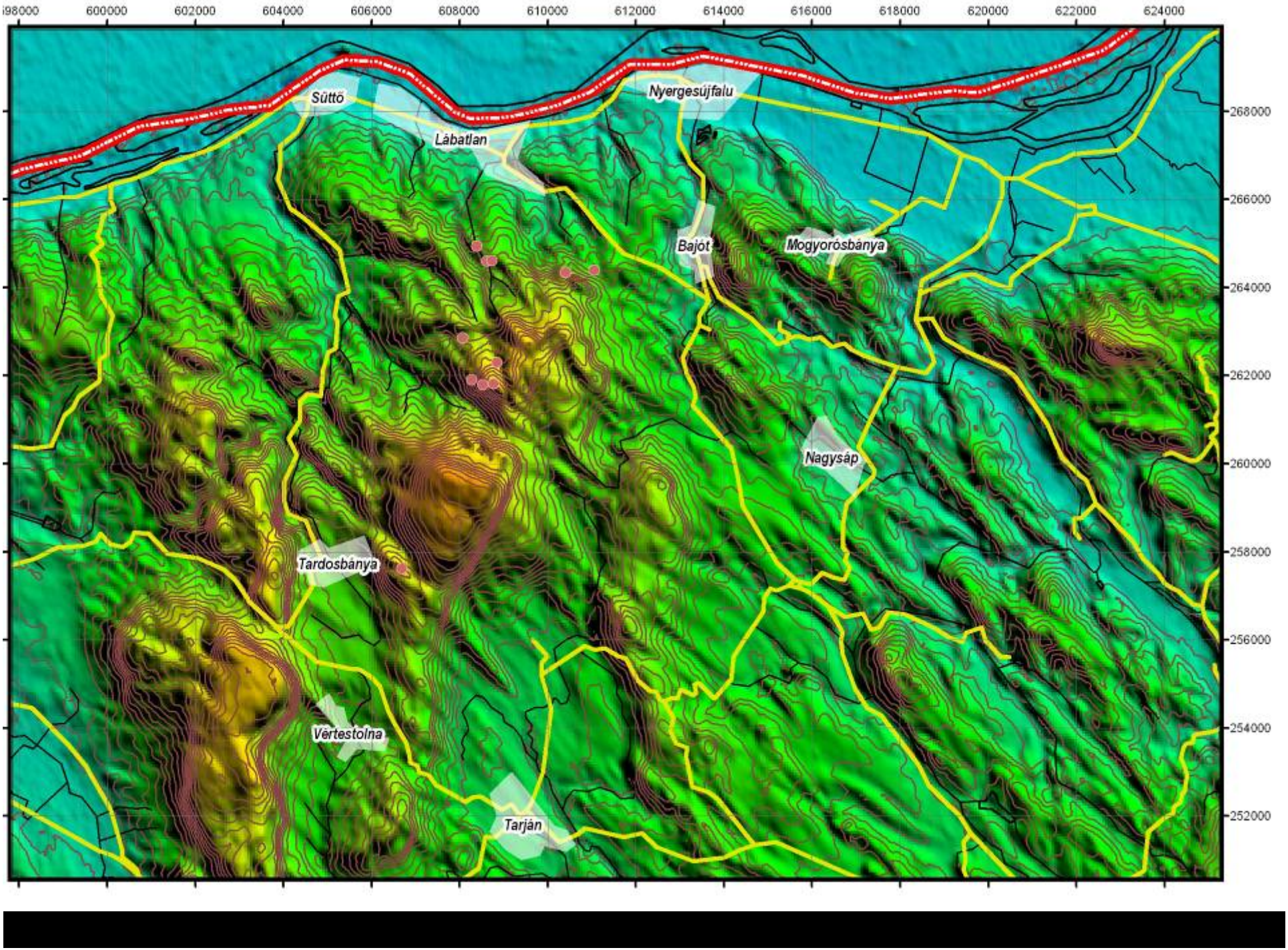
① *Introduction, location and general description*
② *Methods of the folding*
③ *Evidences to the compressional method of the deformation*
④ *Shortening directions*
⑤ *Models of the deformation*
⑥ *Age of the folding*
⑦ *Circumstances of the deformation*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264000
262000
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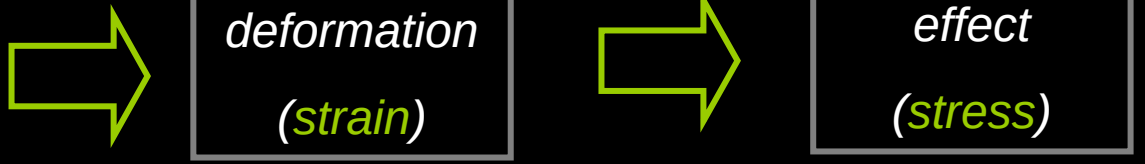
258000
256000
254000
252000
Süttő
Lábatlan
Nyergesújfalu
Bajót
Mogyorósbánya
Nagysáp
Tardosbánya
Vértestolna
Tarján

1., Introduction, general description

- *northern Gerecse Mts: Triassic – Cretaceous sediments*
- *soutern Gerecse Mts: majorly Triassic sediments*

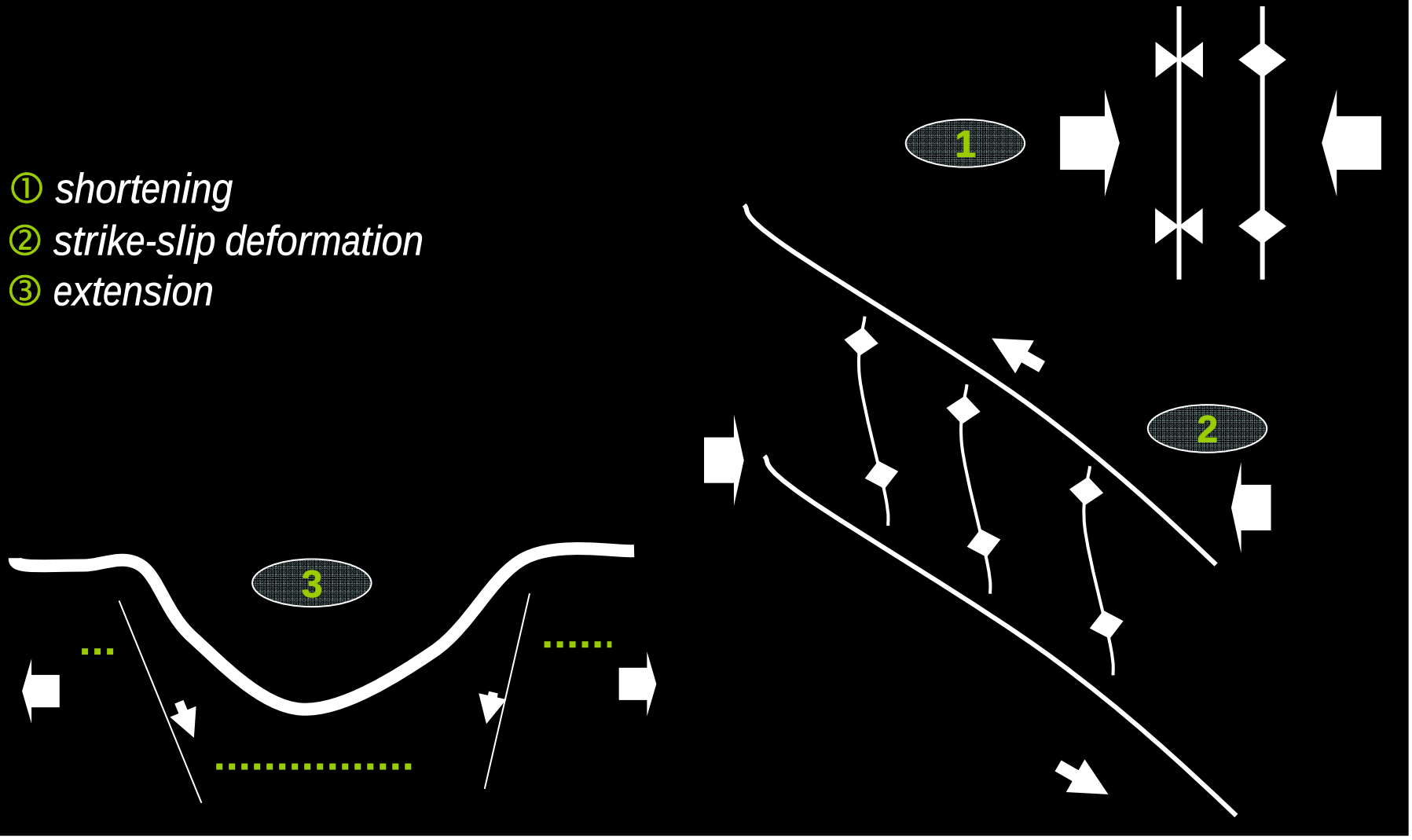
- *basins and environment: cenozoic sediments*

- *folds are characterised by*
  - *tangential planes*
  - *fold axis*
  - *general geometry*



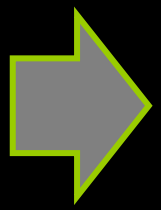
2., Methods of folding

① *shortening*
② *strike-slip deformation*
③ *extension*



3., Evidences to the method of the deformation

- *bedding-parallel striaes*
- *thrust planes*
- *conjugated planes*
- *anomal thickness*
- *duplex structures*

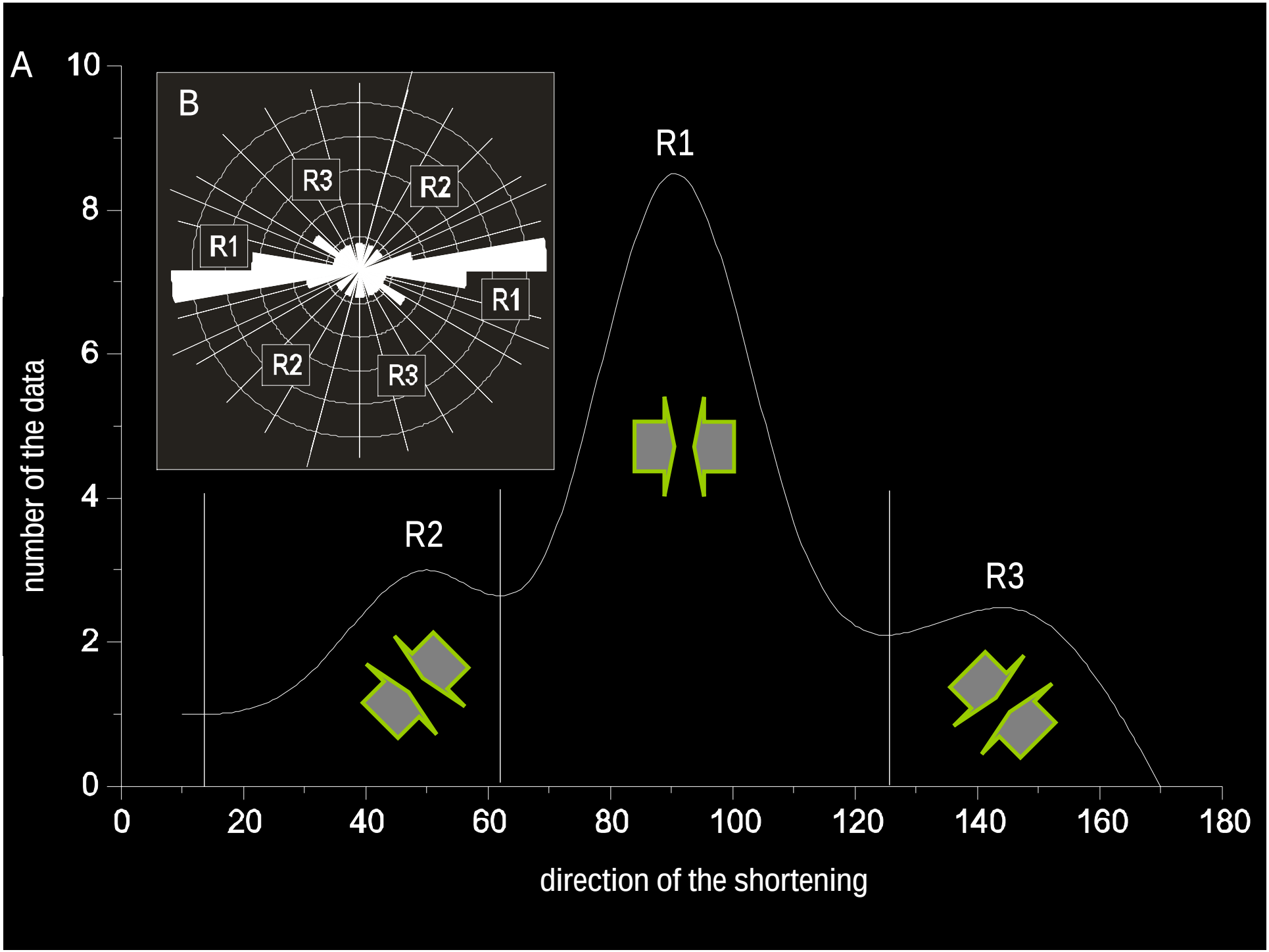


shortening

4., Shortening directions (1#2)

- *fold axis, axial planes, tangential planes*
- *conjugated planes*
- *bedding-parallel striaes*
- *thrusts, duplexes*

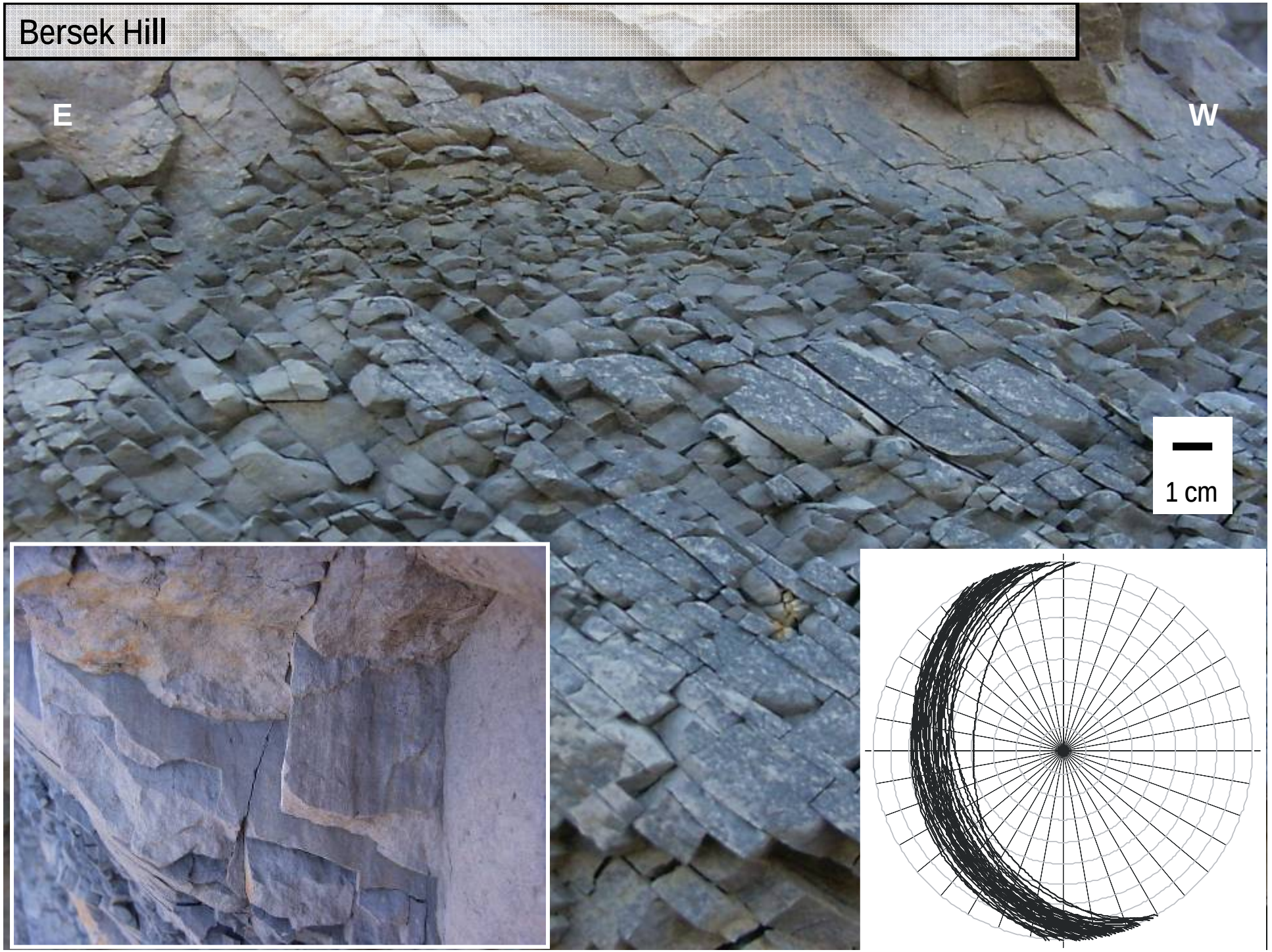
three data sets


A
B
R1
R2
R3
R1
R2
R3
R1
R2
R3
number of the data
direction of the shortening
0
2
4
6
8
10
0
20
40
60
80
100
120
140
160
180

4., Shortening directions (2#2)

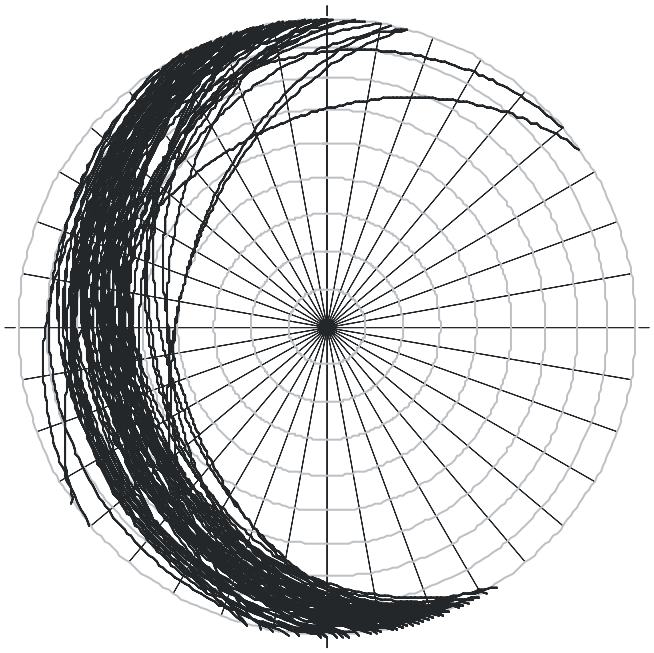
- *W-E shortening*
  - *most significant deformation direction*
  - *divergence from the general structural trend (!)*
- *NW-SE and NE-SW shortening*
  - *minor significance*

Bersek Hill

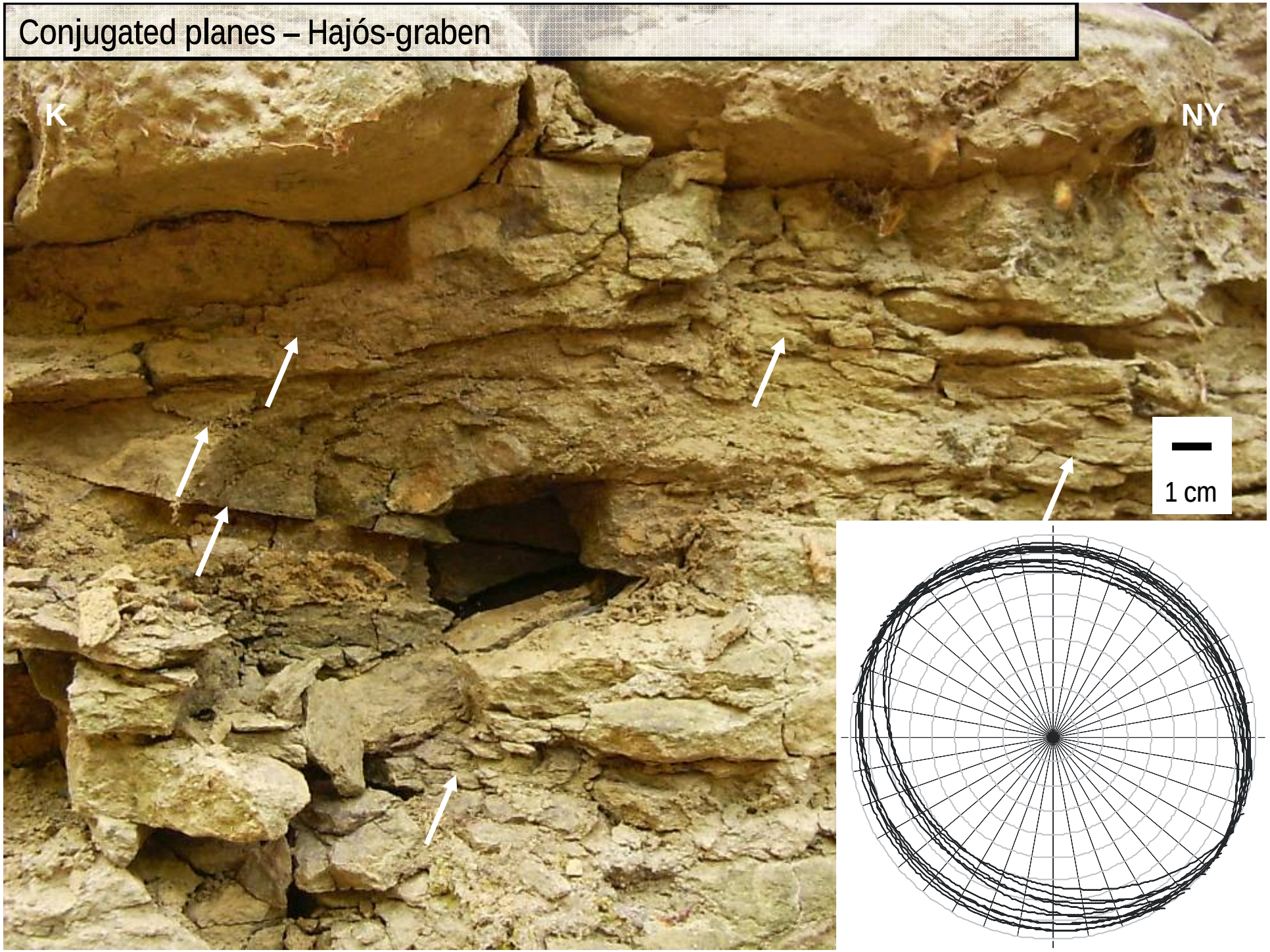


Ördöggát Quarry

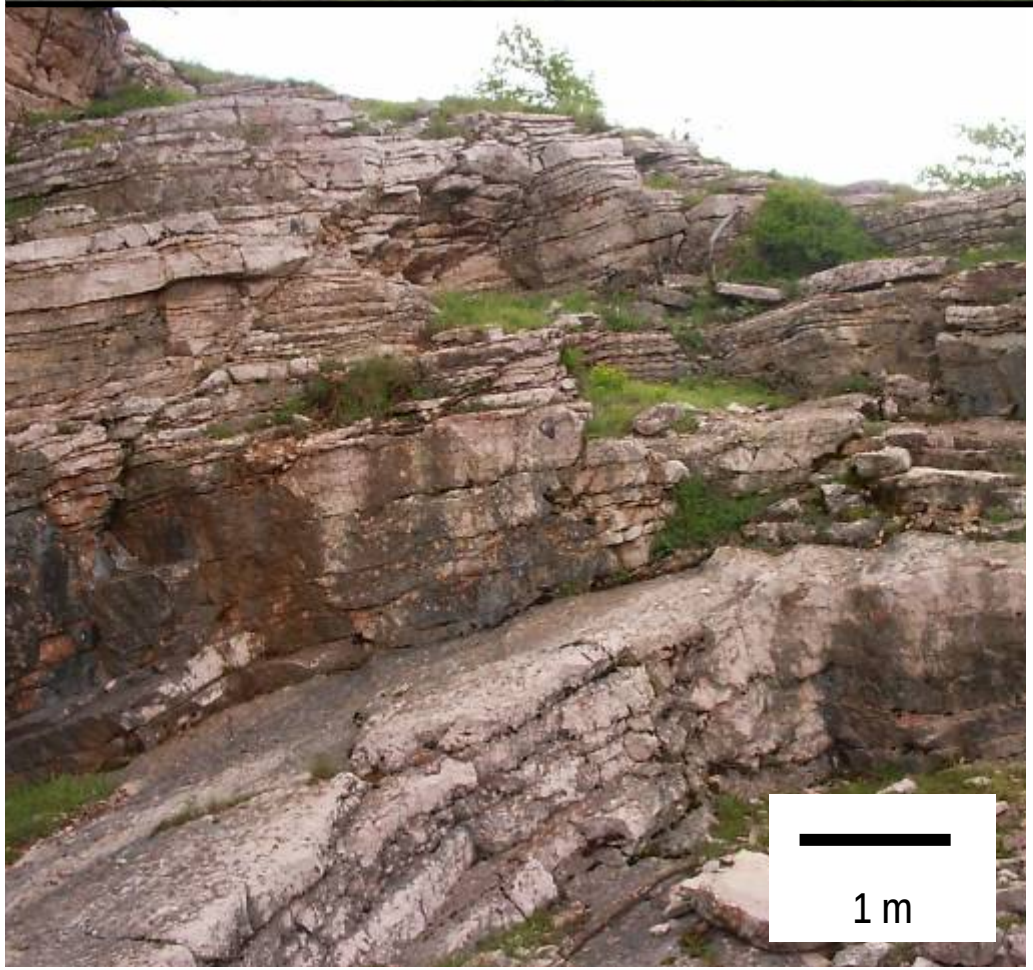
Balkay (1953)

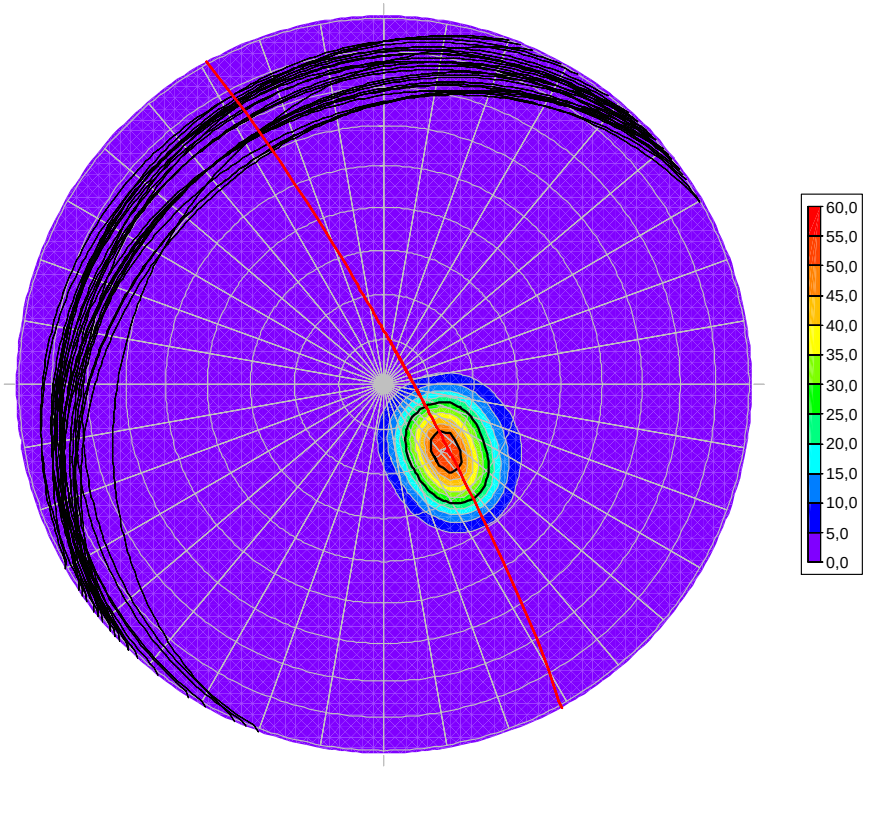


Conjugated planes – Hajós-graben

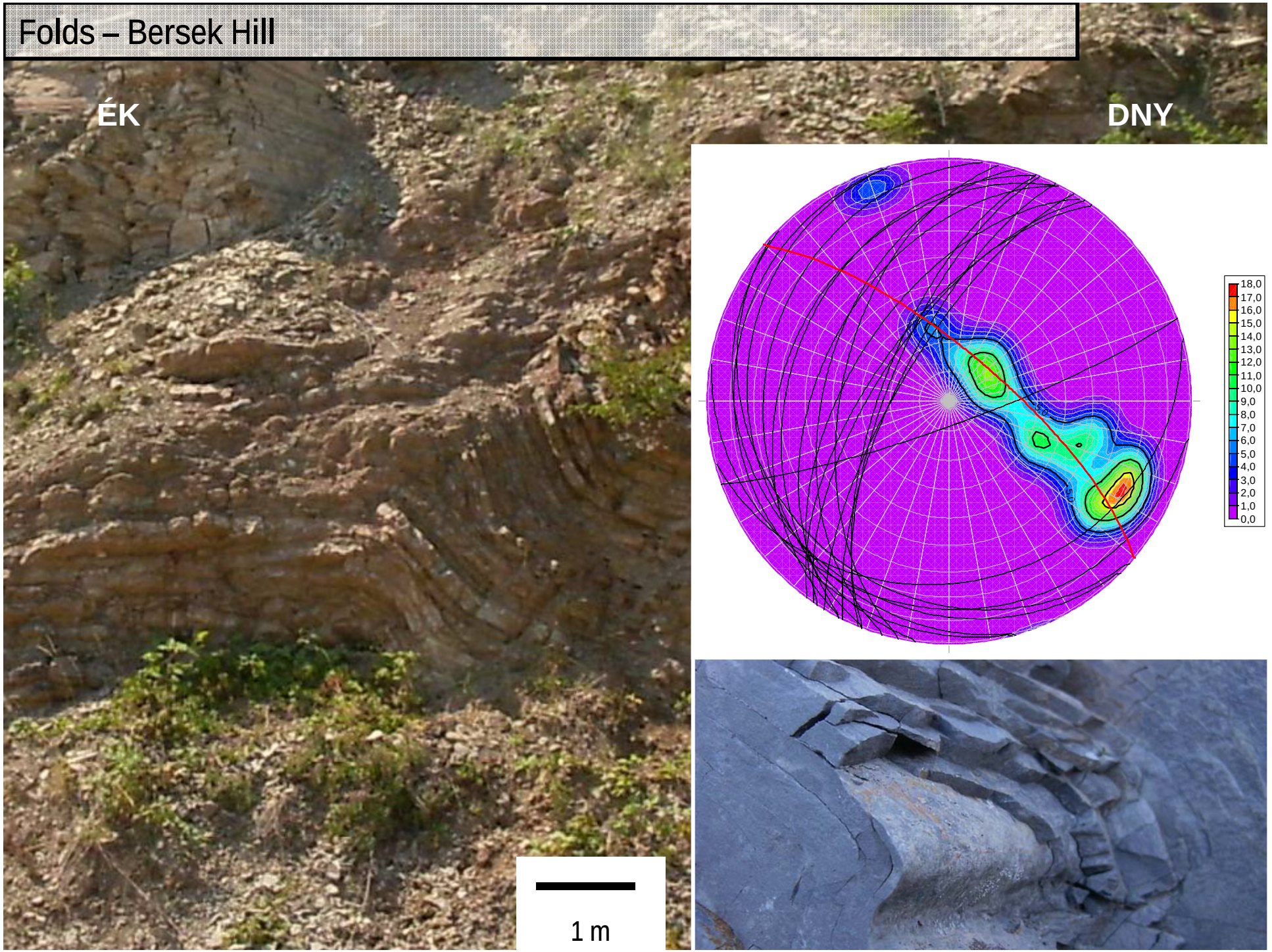


Folds – Nagy-Pisznice Hill





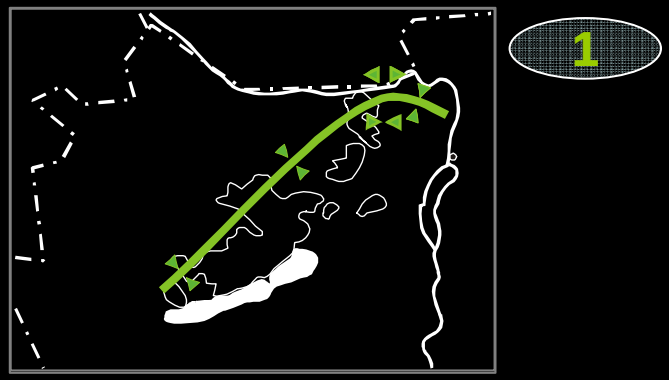
Folds – Bersek Hill

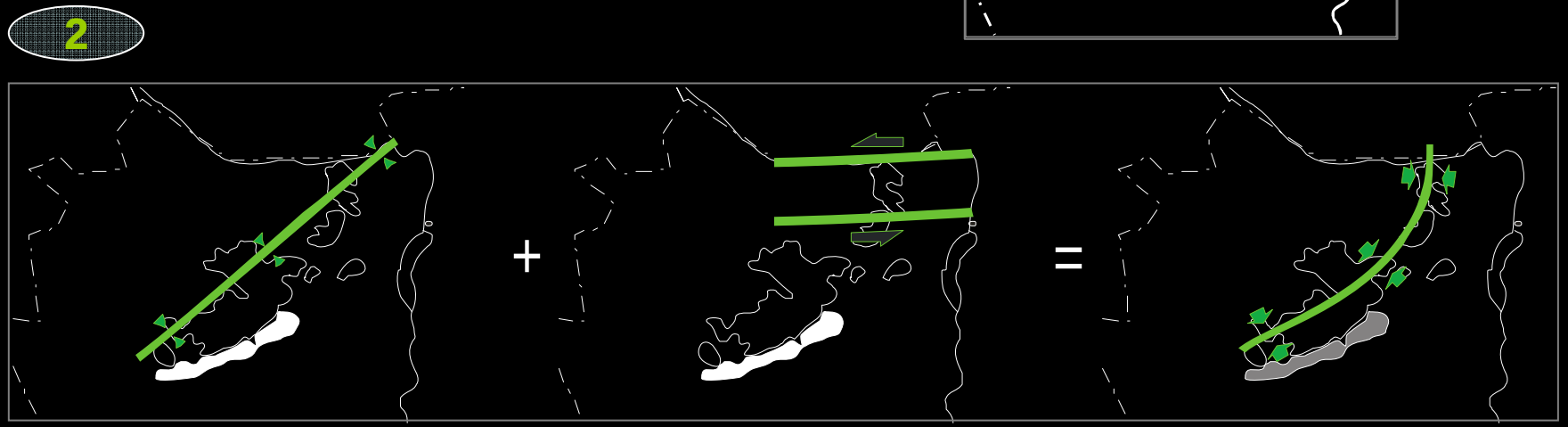


5., Models of the deformation (1#2)

① *the „bending model”* *(Vígh & Szentes 1952; Balla & Dudko 1989)*
in contradiction with Márton (1998), Márton & Márton (1983, 1989)

② *transpression* *(Sanderson & Marchini 1984)*
not any evidence

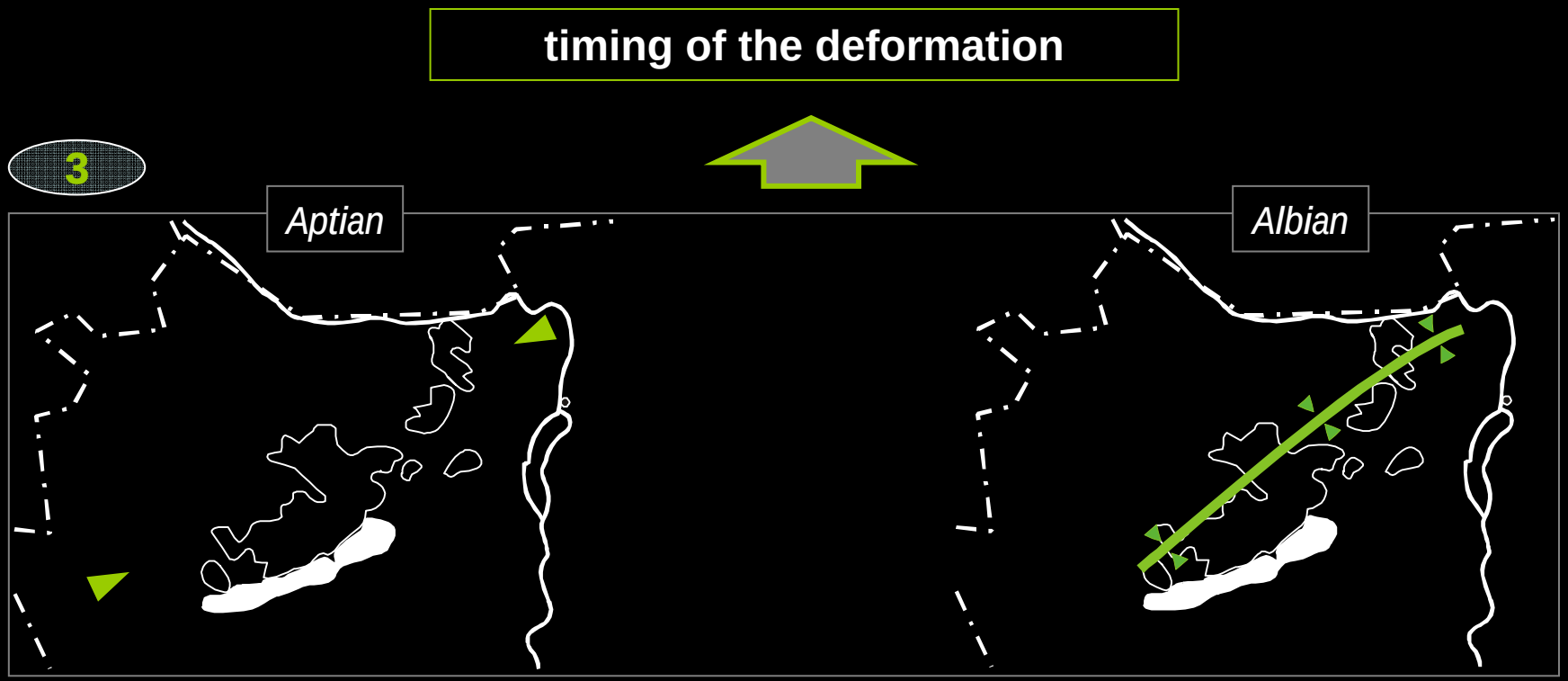




5., Models of the deformation (2#2)

③*flexural deformation model*

(after Mindszenty et al. 1994, Tari 1994, Tari 1995, Mindszenty et al. 2000)

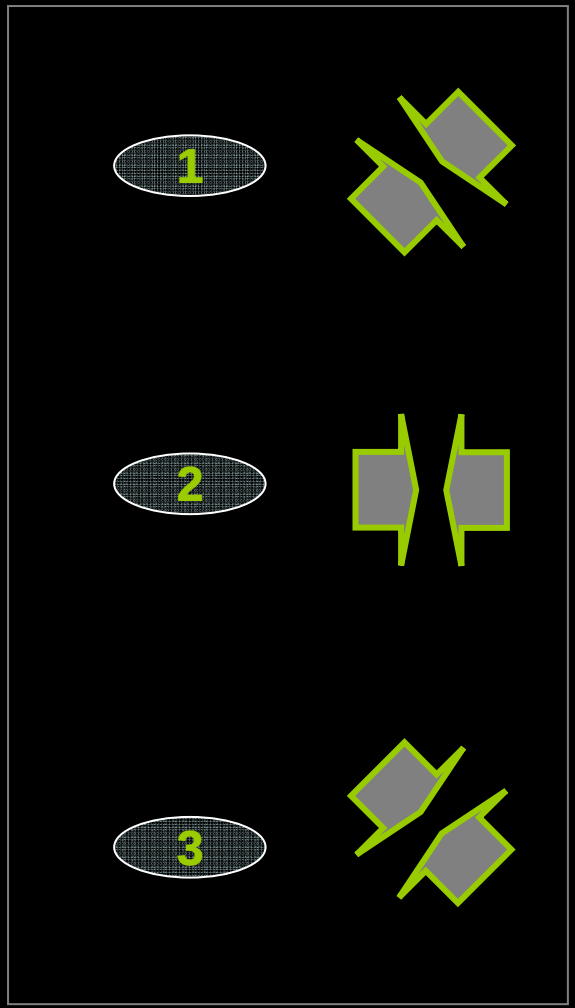


6., Timing of the folding events

- *ONLY with discussion*

① *NE-SW shortening in the Aptian*
② *E-W shortening in the Aptian-Albian*
③ *NW-SE shortening in the Albian*

rotation in the shortening direction in good agreement with Tari (1995) and also Albert (2000)



7., Circumstances of deformation

- *estimation of p and T (Rutter 1970, 1972 and 1974)*
  - *burial depth: 2-3 km (for limestones and shales also)*
- *temperature and diagenesis (Viczián & Pálffy-Kovács 1997)*
  - *temperature: 120 ºC*
  - *burial depth: minimal 2,5 km*
  - *in good agreement with the field observations*

if the corrensite-content is *primary*

- *diagenesis of the Jurassic (Viczián 1995)*
  - *the Jurassic in the Gerecse is more diagenetized as is the Bakony*
- *lithostratigrahy of the Lábatlan-36 borehole (Fogarasi 2001, Főzy et al. 2002)*
  - *drastic change (in the sedimentation rate?) between NC7a and NC8 zones*

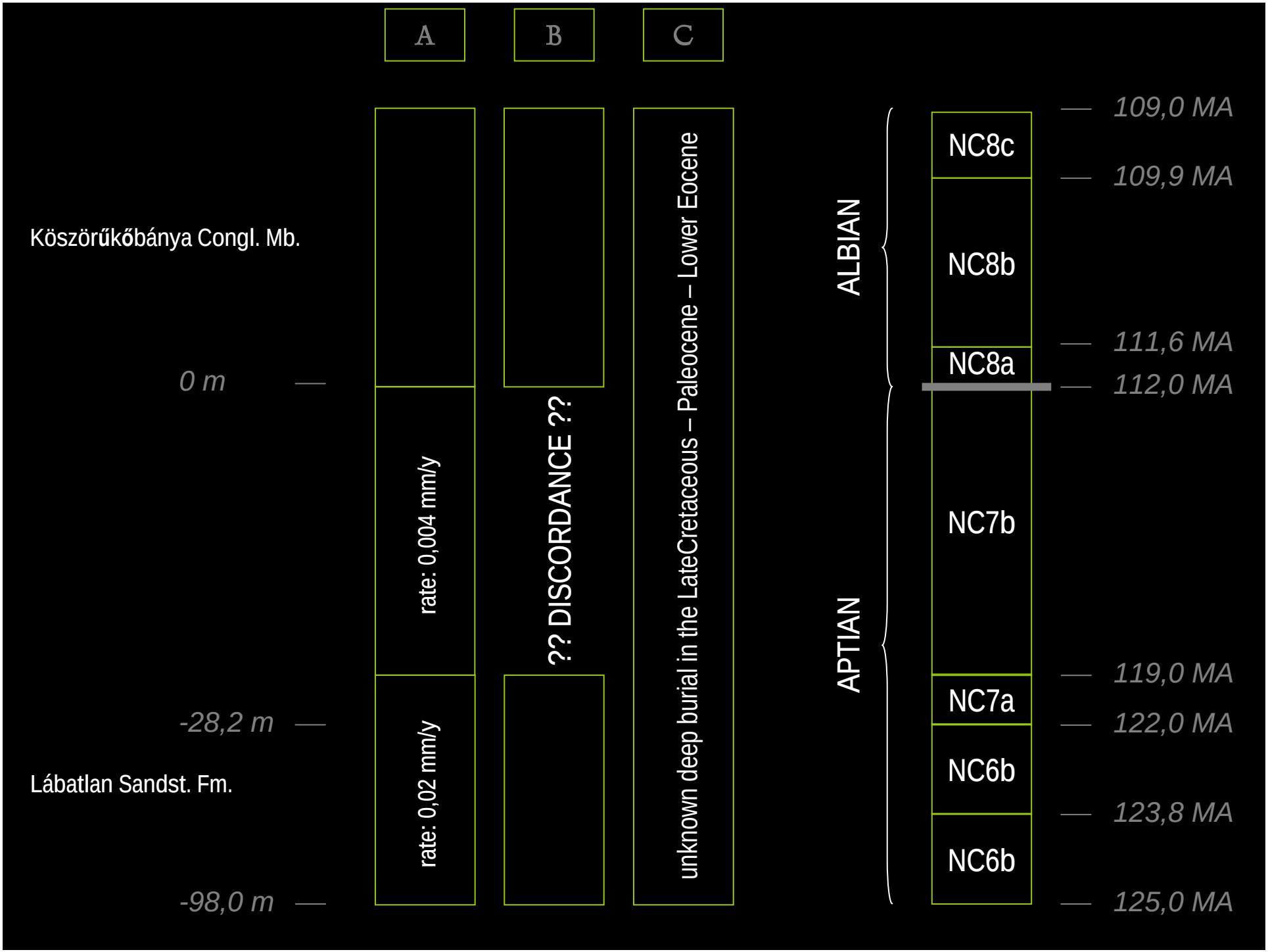
not sedimentary, but *tectonic* burial?

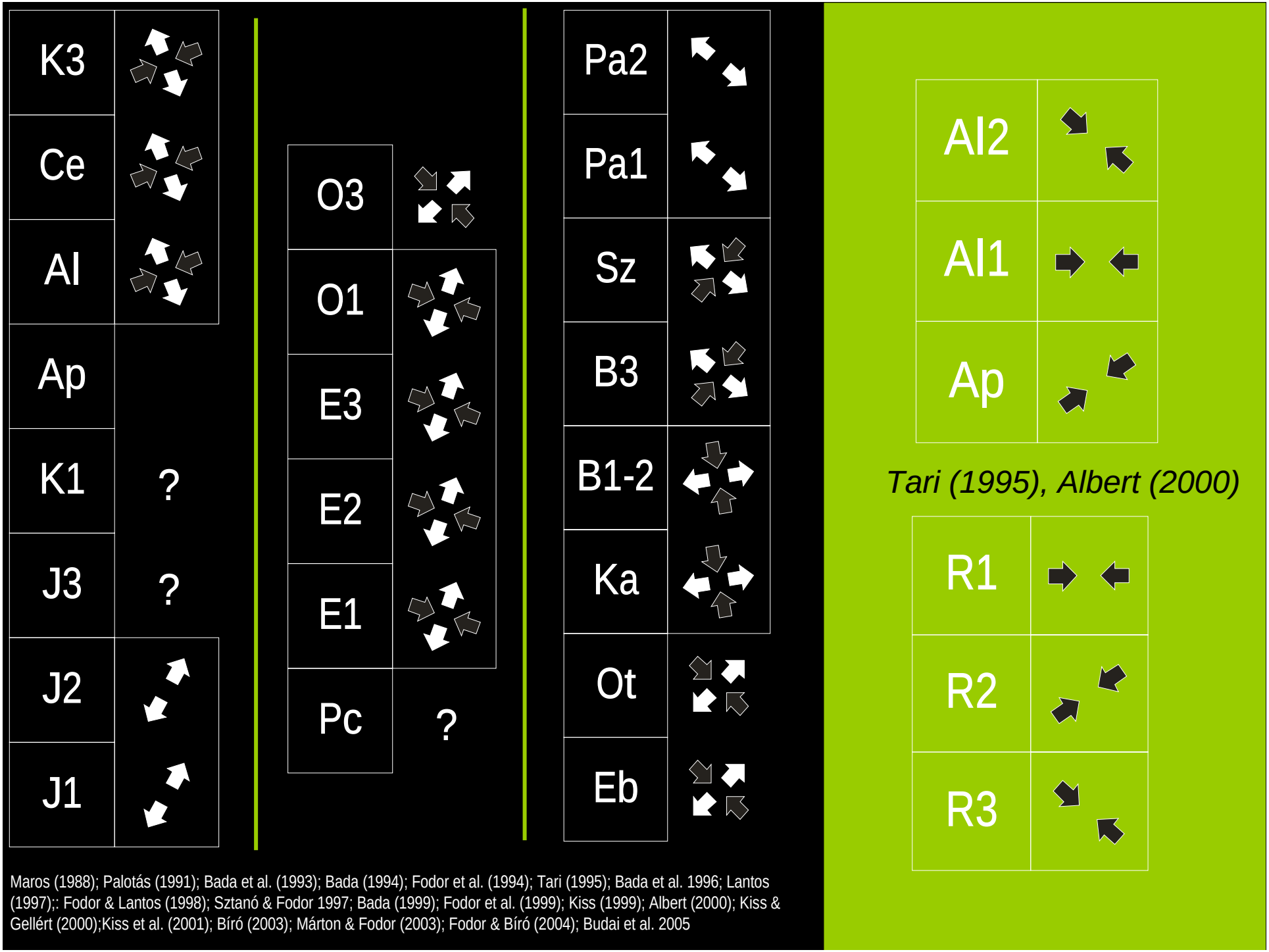
7., Acknowledgement

- *...to the MOL Plc.*
- *...to the Eötvös Loránd University*

- *...to László Csontos (MOL Plc.)*
- *...to Gizella Bagoly-Árgyelán (MOL Plc.)*
- *...to László Fodor (MÁFI / HUNTek)*

- *...and for You ☺...*


A
B
C
Köszörűkőbánya Congl. Mb.
0 m
-28,2 m
Lábatlan Sandst. Fm.
-98,0 m
rate: 0,004 mm/y
rate: 0,02 mm/y
?? DISCORDANCE ??
unknown deep burial in the LateCretaceous – Paleocene – Lower Eocene
ALBIAN
APTIAN
NC8c
NC8b
NC8a
NC7b
NC7a
NC6b
NC6b
109,0 MA
109,9 MA
111,6 MA
112,0 MA
119,0 MA
122,0 MA
123,8 MA
125,0 MA



Maros (1988); Palotás (1991); Bada et al. (1993); Bada (1994); Fodor et al. (1994); Tari (1995); Bada et al. 1996; Lantos (1997);: Fodor & Lantos (1998); Sztanó & Fodor 1997; Bada (1999); Fodor et al. (1999); Kiss (1999); Albert (2000); Kiss & Gellért (2000);Kiss et al. (2001); Bíró (2003); Márton & Fodor (2003); Fodor & Bíró (2004); Budai et al. 2005