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Hydrobiological and fish monitoring

Danube Monitoring Scientific Conference Publication, Slovak Section, chapter:

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Compiled by Iľja Krno and Mikuláš J. Lisický

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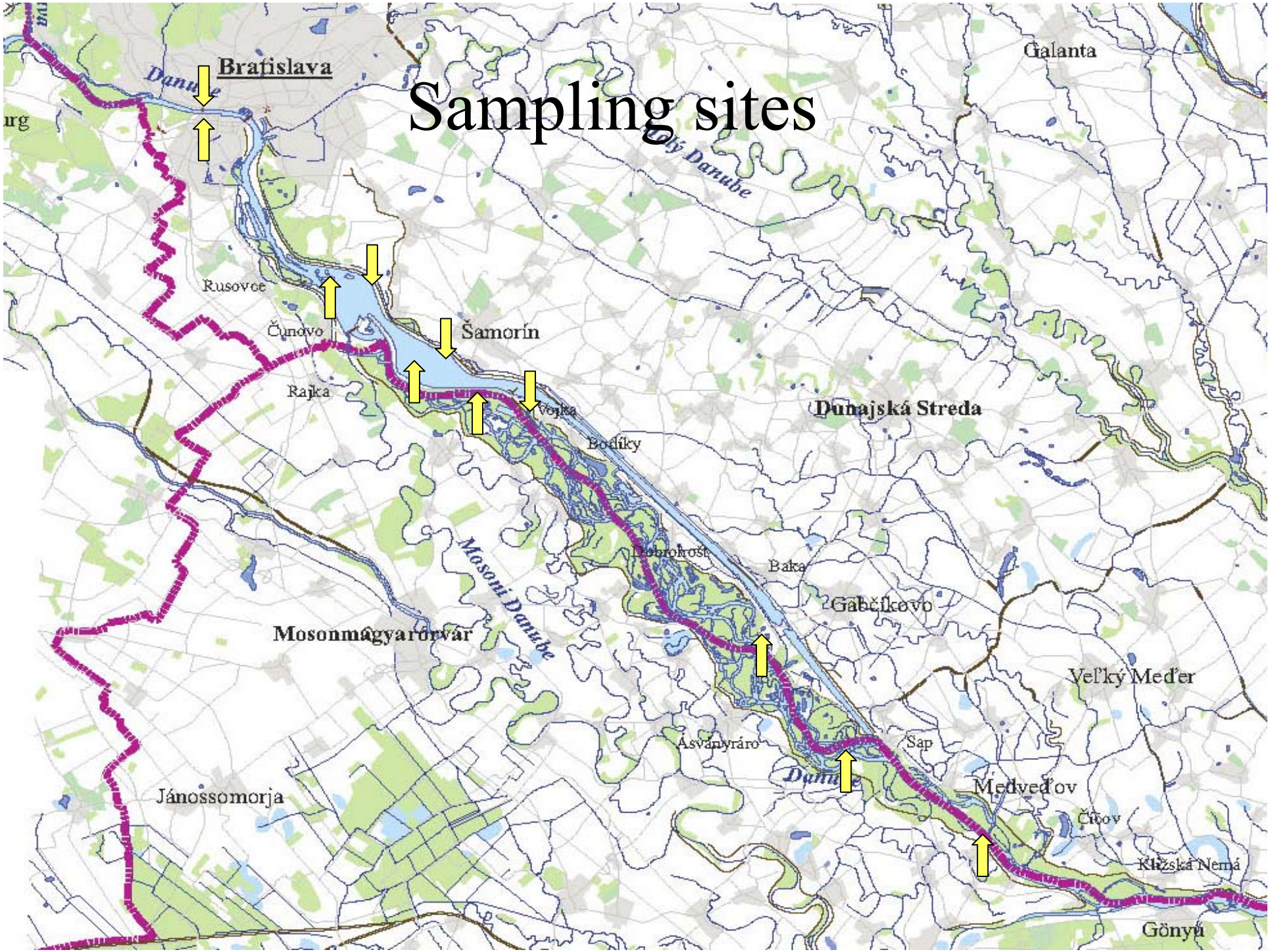
V.2.2. Monitoring of saprobity based on composition of macrozoobenthos in the Danube, Čunovo reservoir and the arm system between Bratislava and Medved'ov in 2002-2005

Štefan Nagy

Sampling sites:

1. The Danube
   - Bratislava (left and right riverbank in a lotic habitat)
   - Dunakiliti (left riverbank in lotic and lenitic habitat)
   - Sap (left riverbank in lotic and lenitic habitat)
   - Medveďov (left stony groin in lotic habitat)
2. The Čunovo Reservoir
   - Upper part at Kalinkovo (in streamline and left riverbank)
   - Lower part at Šamorín (in left and right bays in lenitic habitat)
3. The Arm system
   - at the beginning near Dobrohošť (in lotic habitat)
   - upstream from the mouthing into Danube at Gabčíkovo (in lotic and lenitic habitat)


Sampling sites
Bratislava
Galanta
Rusovce
Čunovo
Šamorín
Rajka
Dunajská Streda
Vojka
Bodíky
Dobrohošť
Baka
Gabčíkovo
Mosonmagyaróvár
Veľký Meder
Ásványráró
Sap
Medveďov
Čičov
Kližská Nemá
Jánossomorja
Gönyű

Methods

Samples of macrozoobenthos were taken

-in shallow waters by hand net according to

-methods presented in the norm STN EN 27828

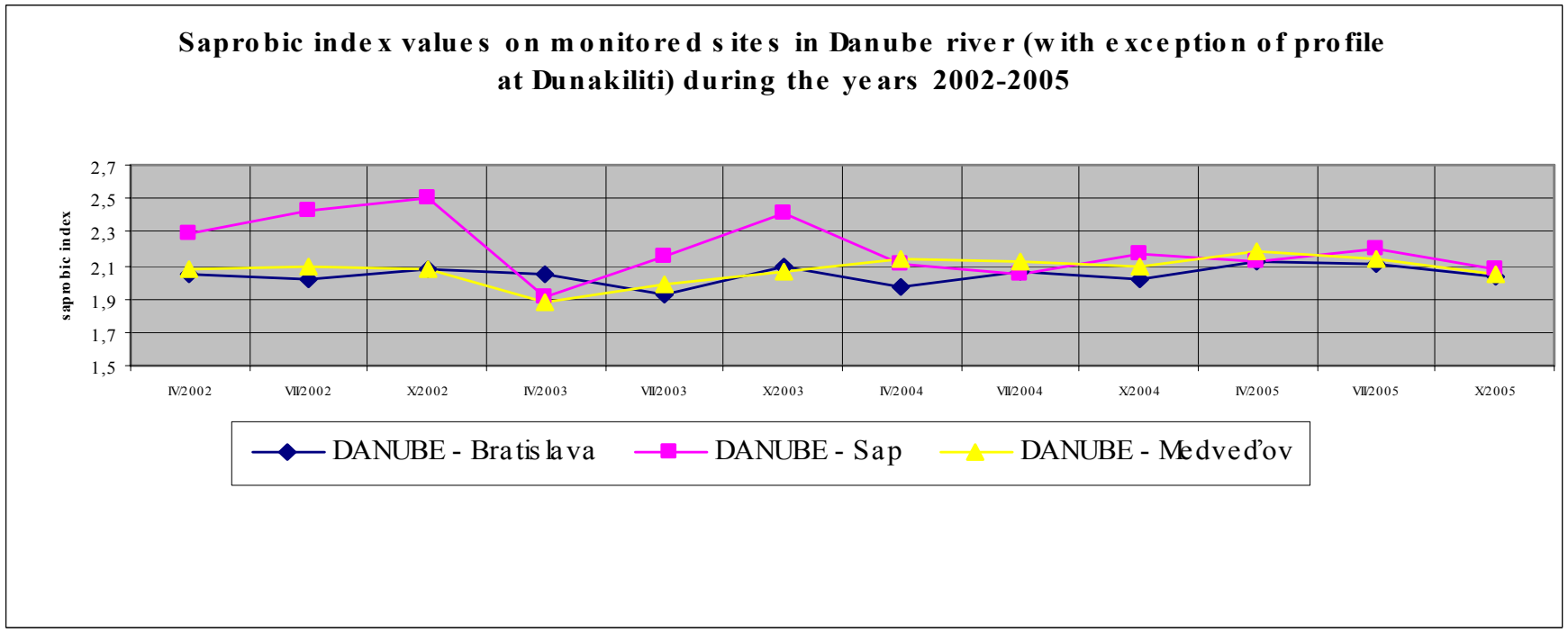
Methods

Samples of macrozoobenthos were taken

-in deep waters by Ekman bottom sampler according to methods presented in the norm STN EN ISO 9391

Results - Danube river

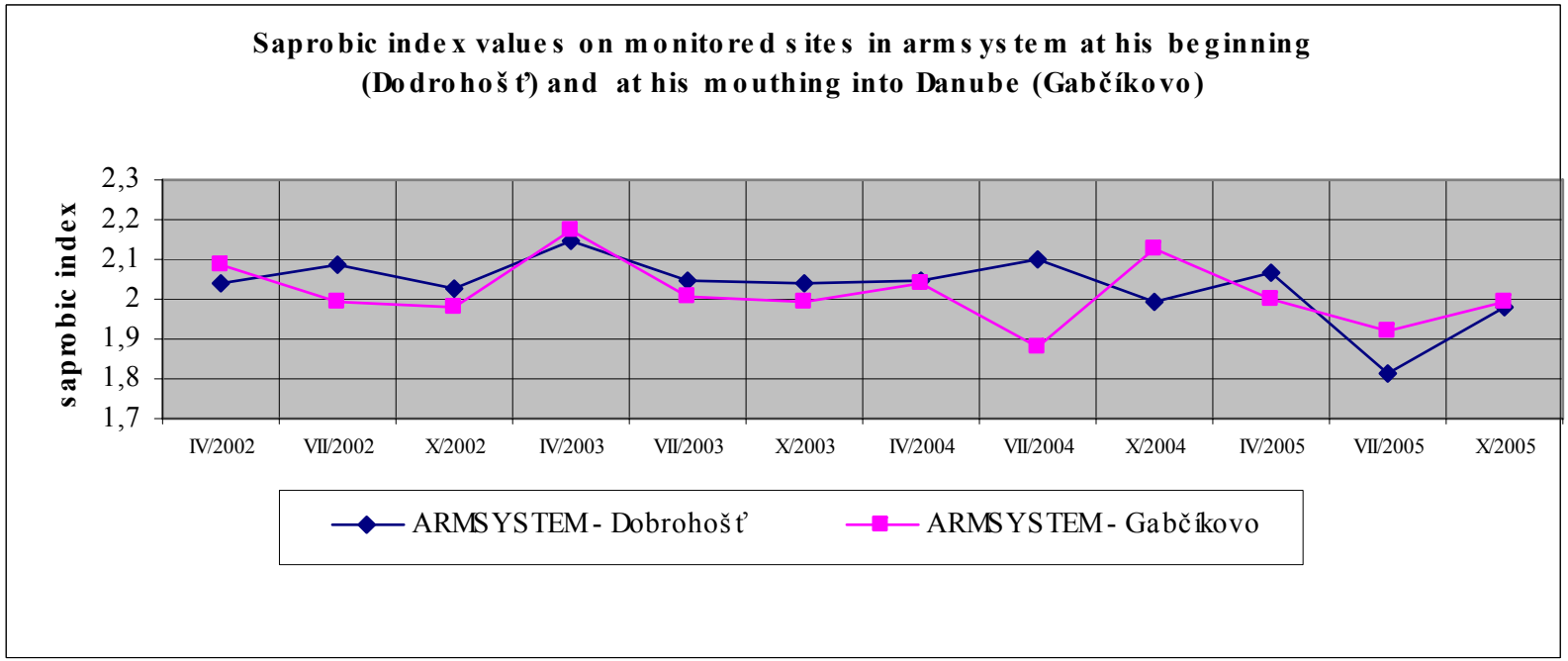
	IV/2002	VII/2002	X/2002	IV/2003	VII/2003	X/2003	IV/2004	VII/2004	X/2004	IV/2005	VII/2005	X/2005
DANUBE - Bratislava	2,05	2,01	2,08	2,05	1,93	2,10	1,97	2,06	2,02	2,12	2,11	2,03
DANUBE - Sap	2,29	2,42	2,51	1,91	2,15	2,41	2,11	2,05	2,17	2,12	2,20	2,08
DANUBE - Medved'ov	2,08	2,09	2,08	1,88	1,99	2,06	2,14	2,12	2,10	2,18	2,14	2,04



- **values of saprobic index ranged during the whole period from 1,88 to 2,51 with the average 2,11**
- **this correspods dominantly to beta-mezosaprobity in the spring, summer and autumn**
- **the main indicating species are** *Dikerogammarus villosus, Corophium curvispinum, Jaera istri, Lithoglyphus naticoides, Theodoxus danubialis* **and** *Cricotopus sp.*

Results – arm system

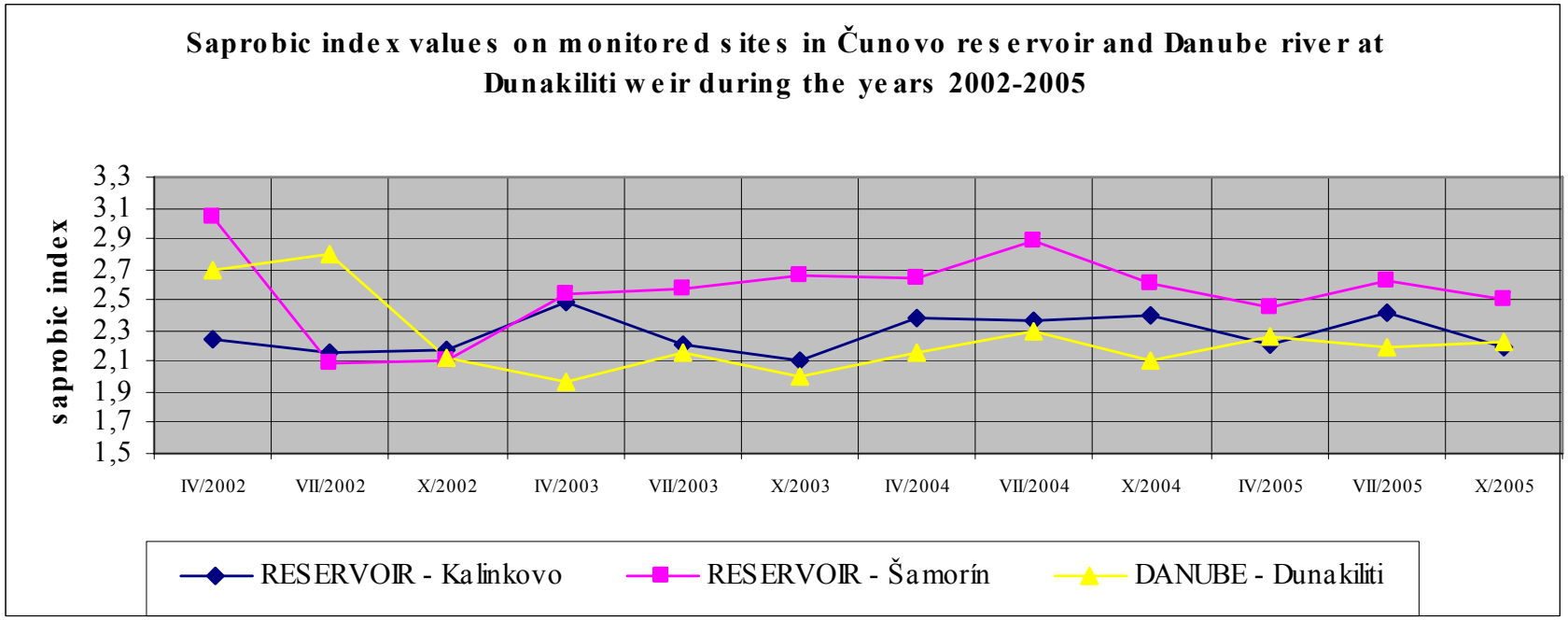
	IV/2002	VII/2002	X/2002	IV/2003	VII/2003	X/2003	IV/2004	VII/2004	X/2004	IV/2005	VII/2005	X/2005
ARMSYSTEM - Dobrohošť	2,04	2,09	2,03	2,15	2,05	2,04	2,05	2,10	1,99	2,07	1,81	1,98
ARMSYSTEM - Gabčíkovo	2,09	1,99	1,98	2,17	2,01	1,99	2,04	1,88	2,13	2,00	1,92	1,99



- **values of saprobic index ranged during the whole period from 1,81 to 2,17 with the average 2,03**
- **this corresponds to balanced degree of beta-mezosaprobity in the spring, summer and autumn**
- **the main indicating species are** *Dikerogammarus villosus, Dreissena polymorpha, Corophium curvispinum, Jaera istri, Radix peregra* **and** *Cricotopus sp.*

RESULTS – Čunovo reservoir and Danube at Dunakiliti weir

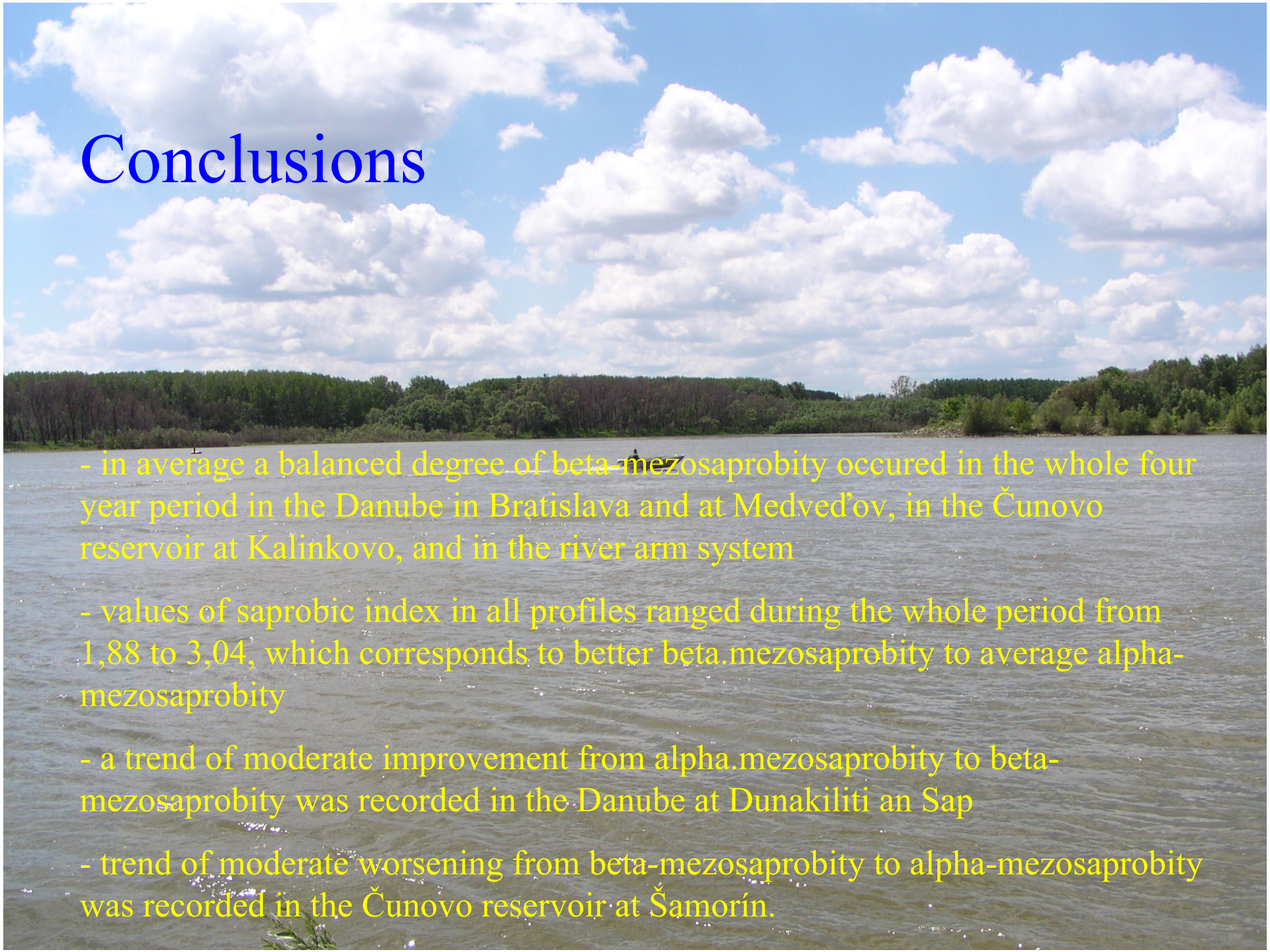
	IV/2002	VII/2002	X/2002	IV/2003	VII/2003	X/2003	IV/2004	VII/2004	X/2004	IV/2005	VII/2005	X/2005
RESERVOIR - Kalinkovo	2,24	2,16	2,17	2,48	2,21	2,10	2,38	2,37	2,40	2,21	2,42	2,19
RESERVOIR - Šamorín	3,04	2,09	2,11	2,53	2,57	2,66	2,65	2,88	2,61	2,45	2,63	2,51
DANUBE - Dunakiliti	2,69	2,79	2,12	1,96	2,16	2,01	2,16	2,30	2,10	2,27	2,20	2,23



- values of saprobic index ranged during the whole period from 1,96 to 3,04 with the average 2,36

-this corresonds in Danube at Dunakiliti weir and Čunovo reservoir at Kalinkovo to worse beta-mezosaprobity in Čunovo reservoir at Šamorin to alpha-mezosaprobity

-the main indicating species in Danube at Dunakiliti weir and in Čunovo reservoir at Kalinkovo are *Dikerogammarus villosus, Corophium curvispinum, Hypania invalida, Phytochironomus fodiens,* **in Čunovo reservoir at Šamorín** *Hypania invalida, Pisidium spp., Sphaerium rivicola, Chironomus spp.* **and unidentified** *Lumbricidae g.sp.* **and** *Tubificidae g.sp.*



Conclusions

- in average a balanced degree of beta-mezosaprobity occured in the whole four year period in the Danube in Bratislava and at Medveďov, in the Čunovo reservoir at Kalinkovo, and in the river arm system

- values of saprobic index in all profiles ranged during the whole period from 1,88 to 3,04, which corresponds to better beta.mezosaprobity to average alpha-mezosaprobity

- a trend of moderate improvement from alpha.mezosaprobity to beta-mezosaprobity was recorded in the Danube at Dunakiliti an Sap

- trend of moderate worsening from beta-mezosaprobity to alpha-mezosaprobity was recorded in the Čunovo reservoir at Šamorín.

Proposals

Monitoring benthic evertebrates has become one of the important biological indices established by the new legislation for monitoring surface water in Slovakia and in the EU. In the interest of a complex evaluation of the Danube it is necessary to expand the network of monitoring places by those situated downstream from Medveďov, downstream from the mouthing of the Váh river into the Danube at Komárno, at Radvaň nad Dunajom, downstream of Štúrovo, and also at the mouthing of the Morava river. Furthermore, it is necessary to revise the norm STN 83 0532 with comments, including a list of indication organisms and their modified indicative values.


Thak You for your attention