

THE TENDENCIES OF THE MEDITERRANEAN CLIMATIC CHARACTER IN HUNGARY

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A mediterrán klímajelleg tendenciái Magyarországon.

Magyarország két helyén a csapadék éves összegai járásának jellemzésére egy alkalmas, úgynevezett Mediterrán Indexet (*MI*) használunk. Szeged és Budapest 120 éves adatsorainak vizsgálata azt mutatja, hogy a csapadék járásának jellege csaknem azonos a két helyen a vizsgált időszakban. Az első évek *MI* értékeinek enyhe emelkedési tendenciája a mediterrán jelleg erősödésére, míg az utolsó 75–110 év (az évek többsége) enyhe csökkenő tendenciája a kontinentális jelleg erősödésére utal.

We use a suitable, so called Mediterranean Index (*MI*) for characterization of variation of yearly precipitation amounts at two places in Hungary. The investigation of 120-year data series of Szeged and Budapest shows that the character of precipitation variation of the two places have almost identical course during the investigated term. The mildly increasing tendency of the first few years in *MI* values shows the dominance of the Mediterranean character, while the mildly decreasing tendency of the last 75–110 years (the majority of the years) shows the dominance of the continental character.

INTRODUCTION, METHOD AND OBJECTIVE

This short study is a further part of a paper on the Mediterranean climatic character in the annual distribution of precipitation in Europe and Hungary (*Koppány and Unger, 1992*). As mentioned in the former paper, Hungary is situated on the border of continental and Mediterranean climatic regions. The authors used the so called Mediterranean Index (*MI*), which is a quantitative value for characterization of Mediterranean character of precipitation (precipitation maximum is in autumn). Theirs formula is the next:

$$MI = (P_{10+11} - P_{5+6}) (100/P_{year}),$$

where P_{10+11} is the amount of precipitation in October and November, P_{5+6} is the amount of precipitation of May and June, P_{year} is the annual amount of precipitation in mm. The greater is the *MI* value the stronger is the Mediterranean character.

As in certain parts of Hungary, *MI* shows a slight continental character (*Koppány and Unger, 1992*), we supposed that regarding a long series of the years, the continental and Mediterranean effects appear alternately. Therefore, we have investigated the precipitation series of two climatological stations which are in possession of at least 120 years' pluviometry, namely the data series of Budapest and Szeged between 1870 and 1989 (*Fig. 1.*). Questions are raised: How close the connection between the precipitation variation of the two stations is? Can significant tendency be pointed out in the index value series during the 120 years or during some subperiods?

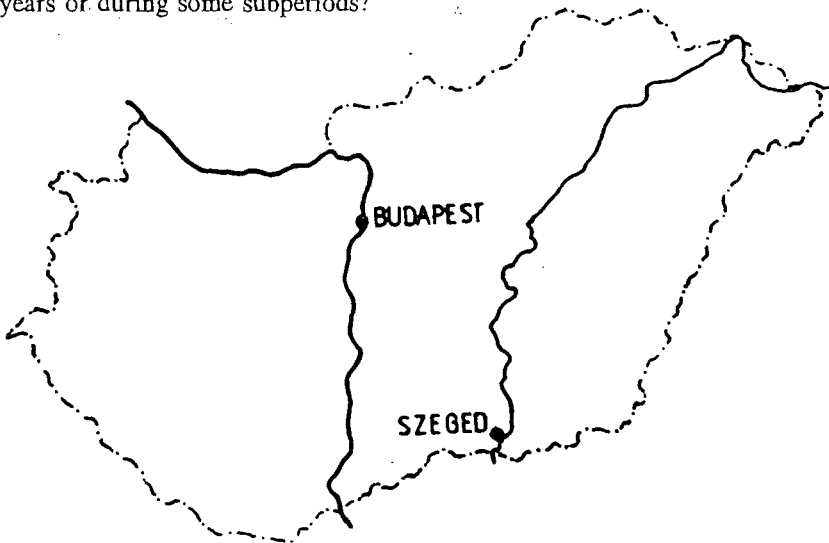


Fig. 1. The situations of the investigated stations in Hungary

RESULTS

We surveyed the 120-year (1870—1989) precipitation series of Budapest and Szeged. The *MI* values were counted up station by station and year by year so as to investigate the closeness of the connection between the characters of the precipitation variations of the two stations by the correlation coefficient. The coefficient was found:

$$r = 0.58,$$

which even at a 1% significance-level relates to a very close connection with an identical sign (the critical value, in case of 120 pairs of value, is $p^{*} = 0.23$).

Thus, in the 120-year precipitation series of the two stations, the years having either a Mediterranean or a continental character, as well as the order of magnitude of the indices alternated in a rather identical manner.

Our investigation extended to every possible interval between 2 and 120 years to point out the incidental tendencies. A lot of longer or shorter significant trends related to different intervals could be pointed out on several significance-level (0.1%, 1% and 5%). Interesting to mention that in case of Szeged much more significant trends could be received than in case of Budapest. All of them are impossible to list, thus only the most typical trends relating to intervals coming one after the other and their parameters are presented (Table I).

It can be seen from the Table I that in case of Szeged the tendency was increasing in the first few years, that means the Mediterranean character became stronger, while the tendency was mildly decreasing in the further much longer phase, that means the continental character dominance grew. In the decomposition of the intervals, where the first few years are not considered, in each intervals the tendency was increasing, however to a different degree. The longest significant trend was related to the last 113 years and its tendency was also decreasing.

In case of Budapest, the two decompositions are hardly different (only 1 year), so their parameters are almost the same. However, the fact established in case of *MI* values of Szeged are also relevant in the case of Budapest.

Table I
Statistical characteristics of *MI* values at Szeged and Budapest (1870—1989)

intervals (years)	trend coefficient (<i>MI</i>)	mean (<i>MI</i>)	standard- deviation (<i>MI</i>)	correlation coefficient	sign. level (%)
<i>Szeged</i>					
1—15 (1870—1884)	1.51	-6.19	12.87	0.526	5
16—45 (1885—1914)	-0.51	-8.99	12.11	0.367	5
46—120 (1915—1989)	-0.18	-6.34	13.12	0.294	1
2—17 (1870—1886)	1.40	-6.37	12.67	0.528	5
18—45 (1887—1914)	-0.57	-9.25	12.36	0.378	5
46—120 (1915—1989)	-0.18	-6.34	13.16	0.294	1
9—47 (1878—1916)	-0.42	-6.47	11.91	0.399	5
48—120 (1917—1989)	-0.18	-6.54	13.18	0.282	5
8—120 (1877—1989)	-0.06	-6.55	12.64	0.164	5
<i>Budapest</i>					
9—45 (1878—1914)	-0.30	-5.4	10.51	0.311	5
46—120 (1915—1989)	-0.13	-4.15	13.28	0.207	5
9—46 (1878—1915)	-0.28	-5.75	10.37	0.301	5
47—120 (1916—1989)	-0.13	-4.12	13.37	0.215	5

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