COSAVA – A BANATEAN WIND

COSAVA – UN VANT BANATEAN

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Abstract: *Coşava is a very intense wind (which sometimes touches 25-30m/s), with a foehn character (the direction of air is perpendicular to the massive mountainous orientation), that blows in the south of the country, along the Danube to the Cazane, and in the south of the Banat region. It direction is generally from south-east toward north-west, and sometimes just the east. This wind appears in the situation which across Romania there is a maximum baric and across Hungarian and Serbia activates a depression, the conditions of a prevailing southern circulation. Coşava is a warm and dry wind which causes the melt of snow in a few days, and maintain, nights after nights minimum temperatures higher then in other regions. The distinguish intensity of the winds frequently produce frost on the ground and the rime early in autumn or late in spring, and seldom fogs.*

Rezumat: *Cosava este un vant foarte intens (atinge uneori 25-30 m/s), cu caracter de foehn (directia de deplasare a maselor de aer este perpendiculara pe orientarea masivelor muntoase), care sufla in sud-vestul tarii de-a lungul defileului Dunarii la Cazane si in sud-vestul Banatului. Directia sa este, in general, de la sud-est catre nord-vest si uneori chiar est-vest. Acest vant apare, asadar, in situatia in care peste Romania exista un maxim baric, iar peste Ungaria si Serbia actioneaza o depresiune, in conditiile unei circulatii predominant sudice. Cosava este un vant cald si uscat, ce determina topirea zapezii in cateva zile si mentine, nopti la rand, temperaturi minime mult mai ridicate decat in alte regiuni. Intensităţile deosebite ale vântului favorizează adesea producerea îngheţurilor şi brumelor timpurii de toamnă sau târzii de primăvară şi rare ceţuri*

Key words: *Cosava, intense wind , early rime , late rime , foehn*
Cuvinte cheie: *Cosava, vant intens, brume timpurii, brume tarzii, efect de foehn*

INTRODUCTION

In the south of Banat, blow a local wind extremely violent with a high frequency, especially in winter, spring and autumn, called by people's place Coşava. The wind speed exceeded the maximum speed recorded by the winds of Romania, produce great damages and has significant consequences for climate. It is an important topoclimatic element for the south-west of our country.

Maghear geographer CHOLNOKY I. (1950) argued that the Coşava wind has a character of the foehn.

The yugoslav geographer VUJEVICI P. (1948) has the opinion that Coşava wind, as a wind in stunts inside the continent are sometimes acquire a thermic characteristics of the foehn and othertimes of the bora wind. N. Topor and I. Stăncescu says that Coşava wind is a very characteristic Romanian foehn and this warm wind in the region is known as the Coşava or Coşeviţa (from Slavka-kick). I. STANCESCU and DOINA DAMIAN (1976) write that Coşava is one of katabatic wind, which descend in stunts on the slopes of the western and south-western Anina and Dognecea Mountains, towards the west and south-west of Tisa Plain. GH MĂHARA (1979) also considered that the Coşava wind has the character of foehn. The foehn wind called Coşava, is a dry wind blowing in the south-west of the country. Is formed because of a

barometric maximum in the region of our country and a baric depressions in Yugoslavia and Hungary.

DATA AND METHODS

Föhn in German, is a downward wind that appears on the slope protection of a mountain. The foehn processes occur when a mass of moist air moving perpendicular to a mountain chain. On the impact with the slope in front of the wind, air mass will have a forced upward movement during which it will gradually gets cold by adiabatic relaxation , with a rate of thermic variation of dry adibatic gradient (approx. 1gr. C / 100 m) until it reach the level of condensation of water vapors (approx. 400 - 500 m from the base of the slope). At this level, clouds will be formed and thus will be precipitation in the form of rain, more intense with increasing the height. In this process it releases latent heat. From the condensation level to the mountain ridge, cooling saturated air mass (U = 100%) will be at the wet adiabatic gradient (0.6 gr. C/100 m), with the transformation of the rain in snow if the temperature will have negative values. The wind will increase to the slopes and will be warm through adiabatic compression (1 gr./100 m), reaching the base of the slopes with a highest temperature (4-6 gr. C) than that from the beginning. The process of adiabatic compression leads to rapid decrease of air humidity, and so the rainfall sudden stops, just below the mountain ridge. The Foehn effects depend of the degree of humidity of air masses (high moisture content), intensity of circulation in the area slopes (intense upward motion), the altitude of the mountain chain and the season (winter, at high wind speeds and the heating processes and drying air mass contrast, compared with the normal period).

In conclusion, the foehn are intense winds installed in a short time, increasing temperature, decreasing moisture and total disappearance of the clouds.

The Foehn explain the existence of different vegetation that can be observed on each of side of a mountain: specify vegetation moist environment on the first side and specify arid environment, even the desert, on the second.

RESULTS AND DISCUSSIONS

The South-west of the Banat is a geographical region with a diversified relief, storied on several levels. It is framed to the south and south-west of the lake formed in boilers, behind the dam at the Iron Gates I, on the east and northeast of Semenic's peaks, just above 1400 m (1445 m vf. Gozna Stone) and west and north-west down the stairs to the west field of the country. There are a series of compartments depression, focusing either on Caras valley and its tributaries, such as Oravița's depression or over the northern sector of the narrow valley of the Danube - Moldova Noua depression (fig. 1).

The topoclimat of these two depressions has submediteranean influenced both in the rainfall, and in the heat. A common feature of both depressions is a great intensities of the local wind, called Coşava, especially in winter and in transitional seasons. The wind gust often reach 15-20 m/s, and exceptionally to 30-35 m/s.

SYNOPTICAL CONDITIONS

Synoptical conditions that causes Coşava wind in the south-west of our country is due to the presence of a anticyclone located in north, northeast or east of our country or covering the country territory, while in the west or southwest of our country is a vast depression or a thalweg centered in the basin of the western Mediterranean Sea. Intensification of wind may also occur in the case of transition, when the anticyclone move to the east of the country or weakens the intensity and from the west or south-west go ahead a cyclone. In both cases the orientation of the isobars are from south to north, and baric gradient between the two regions is large. In altitude, in the lower and in the middle tropospheric, to the east of our country or over

our country usually acting a field of high geopotential, while in the west or south-west of the country is a field of weak geopotential. But Coşava wind is formed only because the relief met in the south of Banat.

Figure 1. Physico-geographical map of the region of southern Banat

The orientations of the chains mountain that edge to the east and north-eastern the two depression gulfs - Oravita and Moldova Noua – is favorable to the intensification of the wind. Coşava is one of katabatic winds. The baric gradient is oriented east-west because of lower air pressure in west of the country, encourages the rowth of wind speed at great intensity.

The predominant directions of Coşava wind is from eastern sector, due both by physical, geographical as to the synoptic conditions. The intensification of the wind frequently occurred from the East. The second direction is from south-east. North-east is the direction with the smallest share.

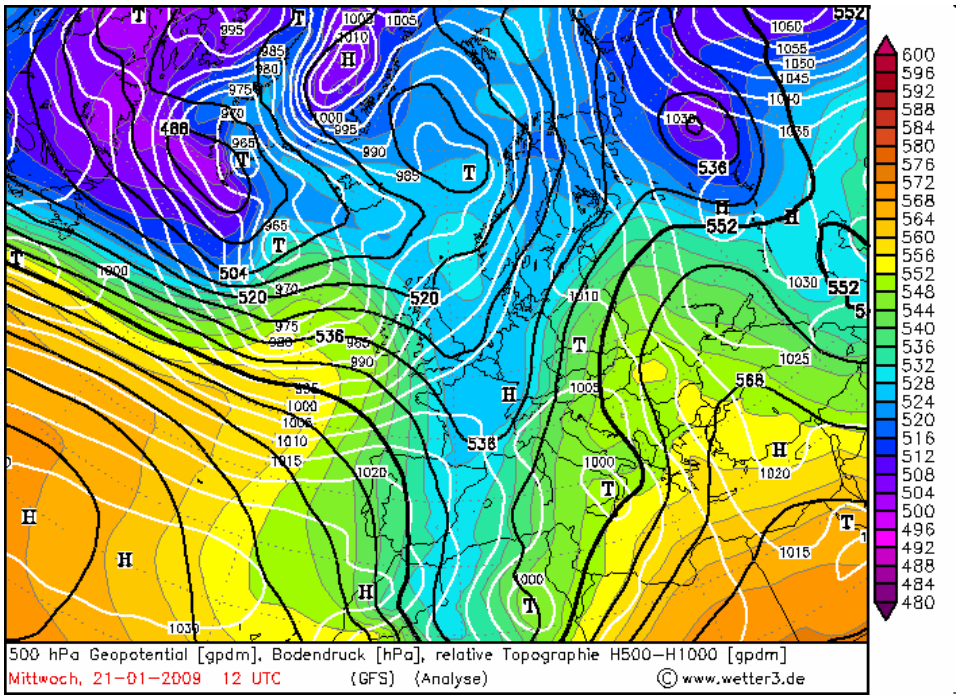
The most frequent cases in which the wind has special intensification occurred in spring and winter.

During a synoptical air specific situations that occur in particular intensification of wind in the south-west of the country persist most often two-three days, but in exceptional circumstances, can cover five to eight days, depending on the activity of both ground and altitudine pressure fields.

Synoptical air situations can be grouped into four representative types of distribution depending on field pressure on ground and field geopotential in altitude.

Type I: On the ground level is notable the presence of a persistent anticyclone over the Russian Plain and an area of depression in the Mediterranean basin. This situation is encountered most often in January, February, March and April.

On the synoptic map of 21.01.2009 we can see the presence of an anticyclonic field located at northeast of our country and a large and deep cyclone go ahead slowly towards our country.



Data recorded in the period 19.01-21.01.2009 at Oravita weather station:

	Tmax. (°C)	Tmin.(°C)
19.01.09	7.1	1.5
20.01.09	15.8	10.4

The intensification of the wind begin at 20.01, from East and the gust have reached 17 m / s. The intensification of wind continue until 23.01 and the maximum gust was 24 m / s. As we can see there is a penetration of mass of hot air, inducing an increase of the minimum night temperature on 19-20.01.09 of 9°C.

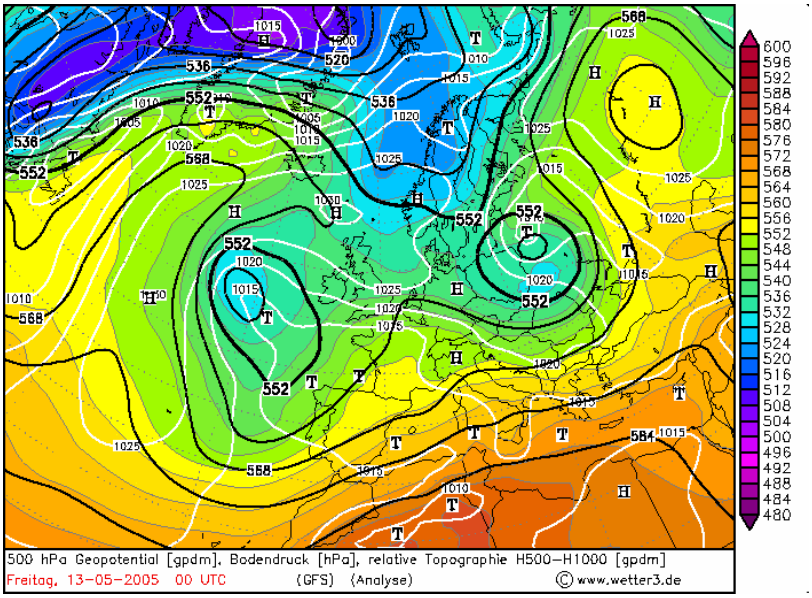
Type II: The dorsal of Scandinavian anticyclone is extending to the south up to our country, while over the Mediterranean basin is active a field of low pressure.

Data recorded in the period 13.05-15.05.2005 at Oravita and Moldova Noua weather station:

	13.05.05	14.05.05	15.05.05	16.05.05	17.05.05
Tmax. (°C)	18,9	22,2	19,2	24,8	24,5
Tmin.(°C)	9,5	13,0	12,2	17,6	20,1

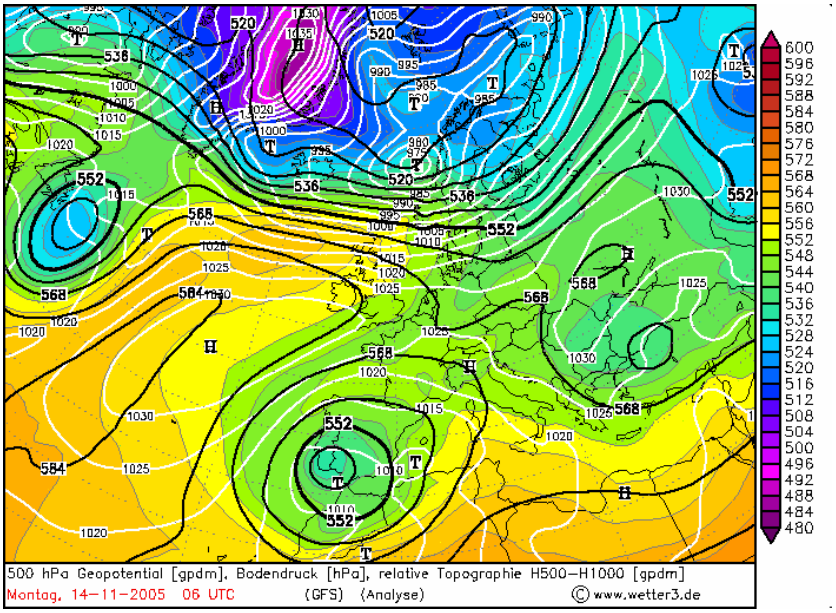
and Moldova Noua weather station

Tmax. (°C)	21,0	22,3	18,5	22,3	23,8
Tmin.(°C)	5,6	14,2	13,8	18,2	19,9



The wind blow in this area for five days from 13 to 18.05.2005 and maximum gust was 23 m / s. Its direction was east-west and increasing temperatures, especially the minimum temperatures was consistent.

Type III: A rare situation is due to the presence of a large ground anticyclonic field over the most part of the continent and a depression or a depression in the thalweg of the central basin of the Mediterranean Sea.



In 12.11.05 a belt of high pressure resulting from the union of the Azores and Eastern European anticyclones is separated by the depression located in the basin of Mediterranean Sea. Beginning with 13.11.05 until 16.11.05 the wind blow strong its gust reaching the 15 m / s. Its predominant direction was south-east to north-west. As we can see the air mass which penetrate is hot and dry. During this period wasn't mentioned any rainfall.

Data recorded in the period 12.11-15.11.2005 at Oravita weather station:

	12.11.05	13.11.05	14.11.05	15.11.05
Tmax. (°C)	6.5	10,6	11,5	13,1
Tmin.(°C)	0.8	5,7	4,5	9,6

and Moldova Noua weather station :

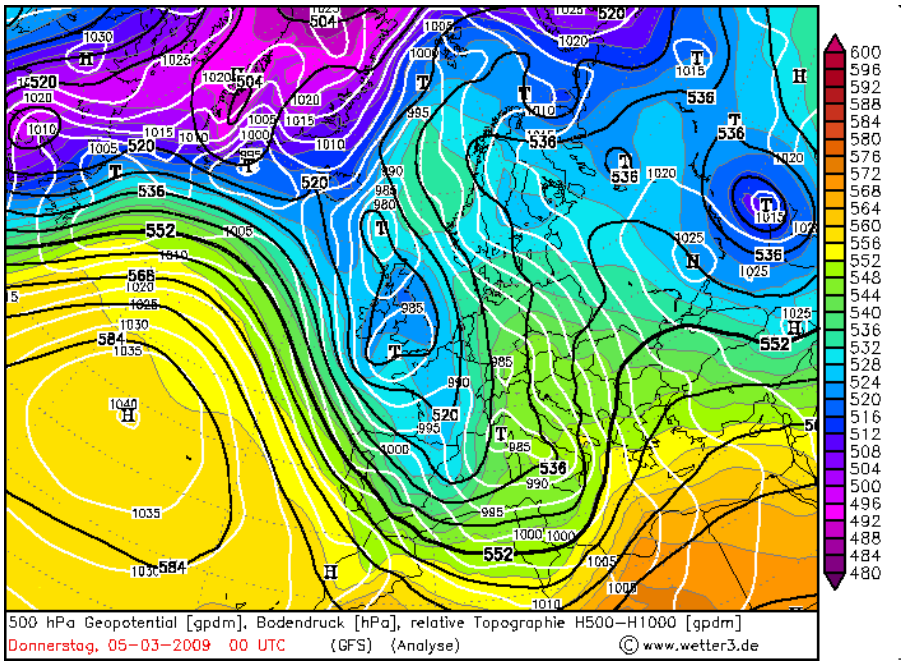
Tmax. (°C)	9,2	9,0	9,1	13,3
Tmin.(°C)	0,2	7,9	6,9	7,7

Type IV: The presence of a maximum barometric over the Russian Plain and a wide area of deep depression which covers the central and south-eastern Europe.

Data recorded in the period 03.03.09-06.03.2009 at Oravita weather station:

	Tmax. (°C)	Tmin. (°C)	Snow layer
03.03.09	9.3	4.1	19 cm
04.03.09	14.0	6.2	11 cm
05.03.09	10.7	9.8	pet.
06.03.09	15.8	5.8	-

Common intensification of wind from the east has been recorded since the morning of 04.03.09. Maximum gust was 19 m / s. In 05.03.09, maximum gust reached 24 m / s and even 30 m / s. The snow was completely melted and the night minimum temperature increase in these nights with more than 5 °C.



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CONCLUSIONS

In this context, will illustrate the interaction between a Mediterranean cyclone that approaches western Balkan Peninsula and the Eastern anticyclone in the slow movement to west. Corresponding there is a lower tropospheric air mass relatively warm and moist covering west and south-west of the country and a mass of cold and dry air over the east and north-east of the country. The Carpathians and the Balkans block the movement of cold air towards the west and south-west from the Russian Plain. In this situation at low levels has been facilitated the penetration of cold and dry air from the Russian Plain, and at intermediate levels warm and moist air penetration of Mediterranean origin. In fact, at first, in the west was hot air in the lower layers and cold air in the layers of media, while in the east was cold air low and warm air above. In these conditions, to the west of the Carpathians, in the lower layers the warm air coming from the south should be forced to penetrates to north, without having the possibility of a normal relaxation through upward, by the tropospheric average, which cause intensification of the south wind sector recorded in Banat, which attests the appearance of a typical case of "Cosava".

Cosava wind is very intense (sometimes reaching 25-30 m / s), with a foehn character (the direction of movement of air masses is oriented perpendicular on giant mountain), which blow in the south-west of the country. Its direction is generally from south-east to north-west or east-west. The wind appears, therefore, in the situation there are over Romania a maximum baric and over Hungary and Serbia activates a depression in conditions of a predominantly southern circulation.

Cosava is a hot and dry wind, which cause melting snow in a few days and maintained a few nights minimum temperatures much higher than in other regions. The special intensities of the wind often causes frost and rimy early in autumn or late in spring and seldom fog.

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