

COMPARISON BETWEEN THE OLTENIA PLAIN AND THE SOUTHERN DOBROUDJA PLATEAU IN TERMS OF PLUVIOMETRIC DEFICIT

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Abstract

The Oltenia Plain and the Southern Dobroudja Plateau are two regions located in the two southern extremities, namely the south-western and the south-eastern extremities of Romania, which display distinct climatic features imposed by multiple climatic influences. The climatic evolution, especially in the last three decades, and the regional manifestations of the climatic phenomena related to global warming induced significant changes within the mentioned regions. In this context, we mention the pluviometric deficit. In the present paper, we have analysed the pluviometric deficit (annual and the warm semester of the year) within the Oltenia Plain and the Southern Dobroudja Plateau registered in the last half of the century (starting with 1961). We made a comparative analysis. The significant differences clearly emphasize the aridization tendency of the regional climate. The paper is useful for climatologists, as well as for students, master and PhD students.

Keywords: *rainfall deficit, drought, anticyclone regime, climatic influences, aridization*

Rezumat

Comparație între Câmpia Olteniei și Platoul Dobrogei de Sud în funcție de deficitul pluviometric. Câmpia Olteniei și Podișul Dobrogei de Sud sunt două regiuni situate în cele două extreme sudice, sud-vestice și respectiv sud-estice ale României cu caracteristici climatice distincte, ca urmare a multiplelor influențe climatice care se exercită asupra lor. Evoluțiile climatice, mai ales din ultimele trei decenii și manifestările regionale ale fenomenelor climatice în legătură cu încălzirea climatică globală au determinat mai ales în aceste regiuni schimbări semnificative. În legătură cu aceste aspecte este și regimul pluviometric deficitar. În lucrarea de față am analizat regimul pluviometric deficitar (anual și cel din semestrul cald al anului) în Câmpia Olteniei și Podișul Dobrogei de Sud din ultima jumătate de secol (începând cu anul 1961), tratând comparativ această problemă. Diferențierile semnificative găsite de noi, demonstrează clar tendința de aridizare a climatului în aceste regiuni. Lucrarea este utilă specialiștilor din domeniul climei, studenților masteranzilor și doctoranzilor.

Cuvinte-cheie: *deficit de precipitații, secetă, regim anticiclonic, influențe climatice, aridizare*

INTRODUCTION

The Oltenia Plain and the Southern Dobroudja Plateau are two Romanian regions located in the two southern extremities of the country – Oltenia in the south-west and Dobroudja in the south-east; they display different climatic features.

Due to the significant differences of the climatic regime (Marinică, 2006, Văduva, 2005), rainfall patterns are also distinct in the two extreme southern regions of Romania. Our study aims at emphasizing these contrasts registered by rainfall regime. Within this framework, we stopped upon the pluviometric deficit (at the annual and warm semester level), as this has severe consequences upon environment and economy over long periods of time.

DATA AND METHODS

For the Oltenia Plain we used the pluviometric data from the present meteorological stations –

Craiova, Băilești, Bechet, Calafat, Dr. Tr. Severin, Caracal, and Slatina (Fig. 1).

For the Southern Dobroudja Plateau we used the pluviometric data supplied by the following meteorological stations (Fig. 1): Mangalia, Adamclisi, Medgidia, Constanța, Hârșova, which are representative for all landforms of the region. The processed data generally covered the interval 1961-2008. The main used method was Hellmann's criterion, which gives us the opportunity of rendering the pluviometric deficit, allowing both a quantitative and qualitative analysis.

DISCUSSIONS

In Oltenia, atmospheric precipitation varies within the territory (as well as within the entire country), from south to north, variation imposed by the altitudinal differences among relief units.

The lowest annual precipitation amounts registered in different years and oscillated between 200 and 300 mm (l/sq m).

The lowest annual amount of precipitation registered in the entire observation period within the Oltenia Plain was 262.7 mm at Băilești and Slatina, in 1992, which means a negative deviation of -305.7 mm, respectively -324.4 mm, namely a pluviometric deficit of 53.7% and 55.2% compared to the mean (568.4 mm is the normal value at Băilești and 586.9 mm at Slatina). Such an amount is comparable to the amount registered on the seashore, at Mihail Kogălniceanu, in 1924 (176.9 mm). Due to the lower multiannual mean (considered normal) (451.0 mm) the negative deviation is also lower (-274.2 mm), which means an annual deficit of about 61% of the normal amount.

The territorial variation of the precipitation amounts from south to north emphasizes negative deviations from the normal, which are extremely important, from -191.8 mm in 2000 at Craiova, the lowest, to -405.1 mm in 2000 at Dr. Tr. Severin, the highest; this illustrates how great precipitation variability in time and space is (Marinică, 2006; Bogdan, Marinică, 2009).

In the Southern Dobroudja Plateau, at Constanța for example, the lowest annual value registered between 1895 and 2008 was 213.7 mm, in 1921, with a negative deviation of -180.4 mm (37.6% of the multiannual mean) compared to the multiannual mean. The highest precipitation amount was 674.6 mm, in 2004, meaning a positive deviation of +280.5 mm (41.6 % of the normal) (Văduva, 2008).

At Craiova, the lowest annual precipitation amount was 269.4 mm, registered in 1907, which means a negative deviation of -271.4 mm (-51.1% of the normal). The highest amount was 1,082.3 mm registered in 2005. The positive deviation reached 551.5 mm (103.9% compared to the normal). Consequently, there are notable differences between the pluviometric regime of the Oltenia Plain and the Southern Dobroudja Plateau. We may also notice that, in the worst case, negative deviations may be -100% (in exceptional situations of total lack of precipitation), while the positive deviations may exceed the normal value.

3.1. Pluviometric deficit for annual values

For the Oltenia Plain, a first global evaluation may be assessed according to the percentage means of weather types¹ according to the pluviometric deficit, calculated for annual precipitation values.

¹ED=excessively dry, VD= Very dry, D= dry, LD= less dry; **Complex drought** is estimated according to the sum of the percentage held by excessively dry and very dry weather; **Moderate drought** is assessed according to the sum of the percentage held by dry and less dry weather.



Fig. 1 Location of the meteorological stations

For the annual values (Fig. 2), we may notice that the excessively dry weather (ED, 18.0%) holds a double percentage compared to the very dry weather (VD, 9.2%). This situation is also available if we compare its percentage to the ones registered by dry and less dry weather. The average of the weather with pluviometric deficit for the entire region is 43.3%.

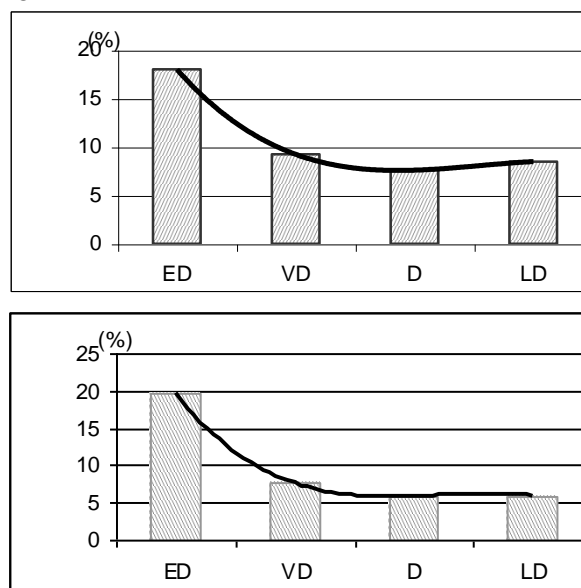


Fig. 2 Percents of the years with pluviometric deficit within the Oltenia Plain (above) and the Southern Dobroudja Plateau (below)

Complex drought predominated with a percentage of 27.2% (about a quarter of the total number of years), while moderate drought registered 16.1%.

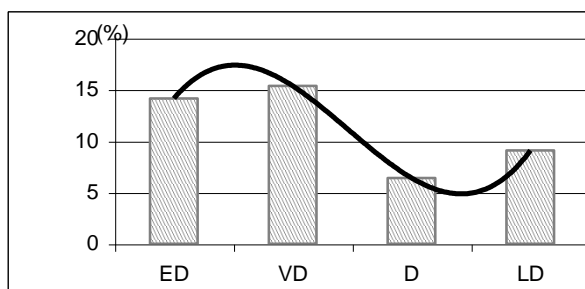
According to the distribution of the weather with pluviometric deficit at each station, the lowest percentage was registered in the central part of the Oltenia Plain, at Craiova (at the southern limit of the hilly area) 25.0%, while the highest percentage in the southern part of the plain, at Bechet, 66.7%. High percentages of the weather with pluviometric

deficit were also registered at Calafat 50.0% and Dr. Tr. Severin 45.9%.

Complex drought registered the highest percentage, 37.5%, at Bechet, in the south of the region, while the lowest percentage, of only 10.4% was held by Craiova.

Moderate drought registered the highest percentage, 29.2%, at Bechet, as well and the lowest at Slatina, only 6.2%. However, in this last case, complex drought represents 34.4%, the second highest value after Bechet.

Excessively dry weather (ED) registered the highest percentage at Calafat and Bechet (22.9%), where local conditions favours pluviometric deficit, and the most reduced at Craiova, only 8.3%. *As for the Southern Dobroudja Plateau*, the percentage of excessively dry weather (ED, 19.6%) is almost three times higher than that of the dry weather (7.58%). It oscillates between 16.7% at Adamclisi and Medgidia and 25.0% at Constanța (Fig. 2), which means higher values than within the Oltenia Plain (a difference of 1.6%). The same predominance of the excessively dry weather can be noticed at all the meteorological stations from the Dobroudja Plateau, except for Constanța where excessively dry weather is almost 10 times higher than the very dry weather. This situation is induced by the seashore location as breeze and air descent imposed by the Black Sea influence frequently lead to the dissipation of the cloud systems, which is also illustrated by the mean annual amount of precipitation of 396.2 mm, the lowest of all the analysed meteorological stations.



VD, D, and LD weather register insignificant differences.

The distribution of complex drought is comprised between 25.0% at Mangalia and Adamclisi and 33.3% at Hârșova, which means it appears in a quarter up to 1/3 of the analysed years. Moderate drought displays a reduced temporal extension in percents, starting from 2.5% at Constanța (but here complex drought is registered in 27.5% of the years) to 16.6% at Medgidia, located in the interior of the Southern Dobroudja Plateau.

On the whole, the cases of pluviometric deficit (DW) ($DW = ED + VD + D + LD$) oscillate between 30.0% at Constanța and 45.8% at Hârșova, located in the western extremity, where the continentalism degree is also higher. Taking into account the more reduced precipitation amounts registered within the studied area (between 396.1 mm at Constanța and 459.9 mm at Adamclisi located towards the southern limit of the plateau) than the ones from the Oltenia Plain (where they oscillate between 531.7 at Craiova and 567.6 mm at Băilești) we may conclude that droughts are more intense in the Southern Dobroudja Plateau than in the Oltenia Plain.

3.2. Pluviometric deficit during the warm semester (April – September)

In April, within the Oltenia Plain, the general average of the month with pluviometric deficit was 45.0%. The percentage values registered at the meteorological stations oscillated between 35.4% at Calafat and 50.0% at Băilești and Slatina (located in the south-west and north-east of the region).

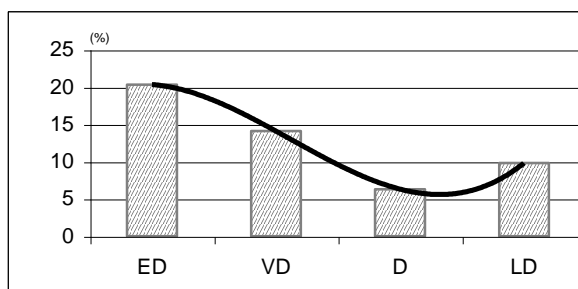


Fig. 3 Pluviometric deficit (%) in April within the Oltenia Plain (left) and the Southern Dobroudja Plateau (right)

The mean general percentage of excessively dry months was 14.1% (about 4% lower than the percent of very dry months) (Fig. 3). At the meteorological stations it was comprised between 10.4% at Caracal and Craiova and 21.9% at Slatina. Complex drought registered in April held a mean percentage of 29.5% (a little more than a quarter of the total number of months). At the meteorological stations, their percentage oscillated between 25.0% at Dr. Tr. Severin and Calafat and 37.5% at Slatina.

The mean general percentage of the months with moderate drought was 15.5%, while at the meteorological stations it oscillated between 10.4% at Calafat and 20.9% at Dr. Tr. Severin.

In April, within the Southern Dobroudja Plateau, the general mean of the months with pluviometric deficit for the entire territory was 50.5%, namely 5.5% higher than within the Oltenia Plain. According to the values registered at the meteorological stations, the mean oscillated between 42.5% at Constanța and

60.4% at Mangalia (both stations with extreme values being located on the seashore). The mean percent of excessively dry months was 20.34% (Fig. 3), while the extreme values were 18.8% at Adamclisi and Hârşova and 22.5% at Constanţa. The mean percentage of very dry April months was 14.1%. It varied between 10.0% at Constanţa and 20.8% at Mangalia (values comparable to the ones registered within the Oltenia Plain).

The mean percentage of April months with complex drought was 34.44%, namely about 5% higher than within the Oltenia Plain. Territorially, the values oscillated between 31.3% at Medgidia and 41.6% at Mangalia. The percentages of the months with moderate drought were about twice smaller than those with complex drought.

We may conclude that in April, the pluviometric deficit is higher in the Southern Dobroudja Plateau than in the Oltenia Plain, while the percentage of the months with different intensity degrees of drought is significantly greater than within the Oltenia Plain (with about 5%). Taking into account that the multiannual amounts of precipitation are lower within the Southern Dobroudja Plateau, spring drought (when plants' water requirements are important) is more intense and frequent here than within the Oltenia Plain.

In May, within the Oltenia Plain the mean general percent of the months with pluviometric deficit reached 54.9%. With regard to the distribution of the meteorological stations, it oscillated between 41.6% at Craiova and 62.5% at Băileşti and Slatina. The mean percentage of the excessively dry weather was 21.9% (Fig. 4), while, in the territory it varied between 14.6% at Craiova and 27.1% at Dr. Tr. Severin, Bechet, and Băileşti.

The percentage of very dry months was on average 14.9% for the entire region, while territorially, the values were comprised between 4.2% at Caracal and 21.9% at Slatina.

The percentage of the months with complex drought was on average 36.8% (about 1/3 of the number of months). Within the territory, the values oscillated between 20.8% at Craiova and 45.9% at Bechet and Băileşti (a similar value was registered at Dr. Tr. Severin, 44.8%), which confirms the increased frequency of spring drought in the south of the Oltenia Plain.

Moderate drought registered in 18.1%; at the stations, it varied between 8.3% at Bechet and 25.0% at Slatina.

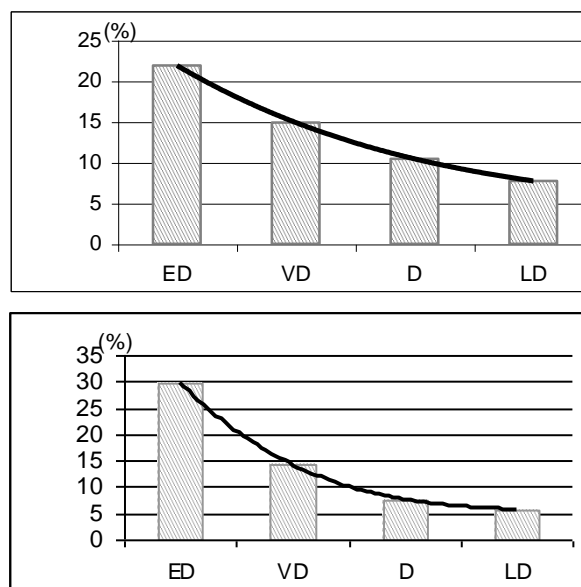


Fig. 4 Pluviometric deficit (%) in May within the Oltenia Plain (above) and the Southern Dobroudja Plateau (below)

In May, within the Southern Dobroudja Plateau, the mean general percentage of the months with pluviometric deficit was 57.3% for the entire territory. As distribution on meteorological stations, it oscillated between 54.1% at Mangalia and 58.3% at Adamclisi, Medgidia, and Hârşova. Compared to the Oltenia Plain, the general mean was about 4% higher than within the Southern Dobroudja Plateau and there were not registered values $\geq 60.0\%$. The percentage of excessively dry months registered a mean of 29.76% (Fig. 4), about 7% higher than within the Oltenia Plain, while the values from the meteorological stations were comprised between 20.8% at Mangalia and 35.4% at Hârşova. We may also notice that the variability of these values was lower than within the Oltenia Plain.

The mean percentage of the months with complex drought was 44.0%, about 3% higher than within the Oltenia Plain. Within the territory, the values were comprised between 33.3% at Mangalia and 50.1% at Medgidia, being more homogenous than within the Oltenia Plain, which suggests climatic conditions of generalized moderate drought in certain months.

Moderate drought reached a mean percentage of 13.3% (much less than in Oltenia). It oscillated between 8.2% at Medgidia and 20.8% at Mangalia, the reduced percentage suggesting that here **moderate drought rapidly transforms in complex drought**.

In June, within the Oltenia Plain, the mean general percentage of the months with pluviometric deficit was 52.1%; the values varied between 45.8% at Bechet and 56.3% at Slatina.

In June, drought is more intense in the southern half of the region, where multiannual monthly amounts of precipitation are lower.

The mean percentage of excessively dry months was 26.5% (Fig. 5), while at the stations it oscillated between 20.8% at Craiova and 37.5% at Slatina, in the south-east, where continental influences are more intense.

The mean percentage of very dry months was 12.3% and the values varied between 3.1% at Craiova and 27.1% at Calafat.

The mean percent of the month with complex drought was 38.8%; territorially, it varied between 31.2% at Craiova and 52.1% at Calafat (the only meteorological station where this percentage exceeds 45%). Thus, we notice the south-western part of Oltenia, with sands (the so-called “Sahara” of Oltenia), where complex drought appears in more than half of the number of June months.

The mean percentage of the month with moderate drought was 13.3%, namely about 1/3 of the months with complex drought, which indicates that, in June, **complex drought** predominates compared to other types of drought. Within the territory, the percentage held by the months with moderate drought varies between 6.3% at Calafat and 16.7% at Craiova.

In June, within the Southern Dobroudja Plateau, the general mean percentage of the months with pluviometric deficit was 52.5%, only 1.4% higher than that registered within the Oltenia Plain; the values oscillated between 43.7% at Mangalia and 60.4% at Adamclisi, being higher and more homogenous than those registered within the Oltenia Plain.

The general mean percentage of the excessively dry months was 20.9% (a little more than 1/5 of the total number of months) (Fig. 5), while within the territory the percentage varied between 15.0% at Constanța and 25.0% at Adamclisi in the south of the plateau. Compared to the Oltenia Plain, the mean general percentage was about 5.5% lower.

The general mean percentage of very dry months was 14.3%; the spatial distribution oscillated between 12.5% at Mangalia and Adamclisi and 18.8% at Hârșova, increasing from south to north; the percentage is just a little lower than that registered within the Oltenia Plain (with only 1.9%).

The mean percentage of the month with complex drought reached 35.2%, while within the territory, the percentage of the months with complex drought was 30.0% at Constanța and 37.6% at Hârșova, about 3% lower than that registered within Oltenia.

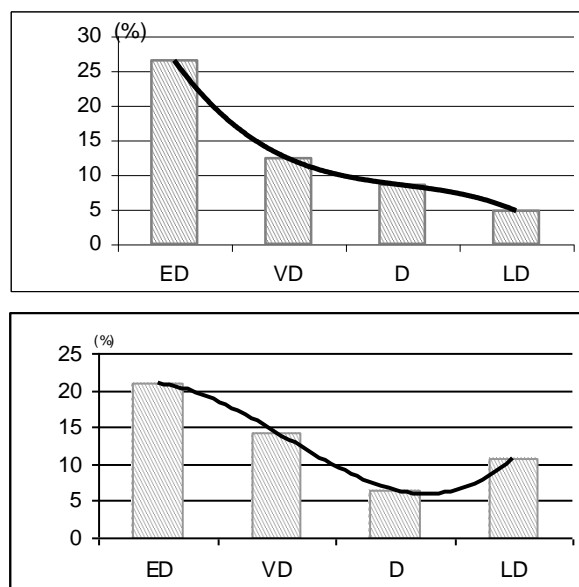


Fig. 5 Pluviometric deficit (%) in June within the Oltenia Plain (above) and the Southern Dobroudja Plateau (below)

The percentages held by dry (D) or less dry month (LD) months were relatively reduced; this is why it would be better to discuss their sum, namely the percentage of the months with moderate drought (MD) (Fig. 5).

The general percentage mean of the months with moderate drought was 17.3%; within the territory, they varied between 8.3% at Mangalia and 22.9% at Adamclisi, namely higher than in Oltenia.

Even if these values are a little lower or comparable to those registered within the Oltenia Plain, in our opinion, **droughts registered in June are more intense** within the Southern Dobroudja Plateau than within the Oltenia Plain. First of all, it is a *lower multiannual monthly amount of precipitation* than within the Oltenia Plain and, thus, the percentage deficits emphasize a more acute lack of precipitation. Secondly, it is about *wind regime* within the Southern Dobroudja Plateau, which is more “alert” than within the Oltenia Plain leading to the increase of the evapotranspiration intensity.

In July, within the Oltenia Plain, the general mean percentage of the months with pluviometric deficit was 49.9% (about 2% lower than that of June), while within the territory, it varied between 41.7% at Craiova and 56.3% at Dr. Tr. Severin.

The general mean percentage of excessively dry months (ED) was 24.9% (Fig. 6) (about 1/4 of the total number of months); territorially, the excessively dry months oscillated between 20.8% at Băilești and Craiova and 31.3% at Calafat and Caracal.

The percentages of dry (D) and less dry (LD) months were generally lower and this is why it is

enough to discuss the regime of the months with moderate drought (MD). For the Oltenia Plain, the general mean percentage of the months with moderate drought (MD) was 14.5%, while within the territory it varied between 10.4% at Calafat and 21.9% at Slatina.

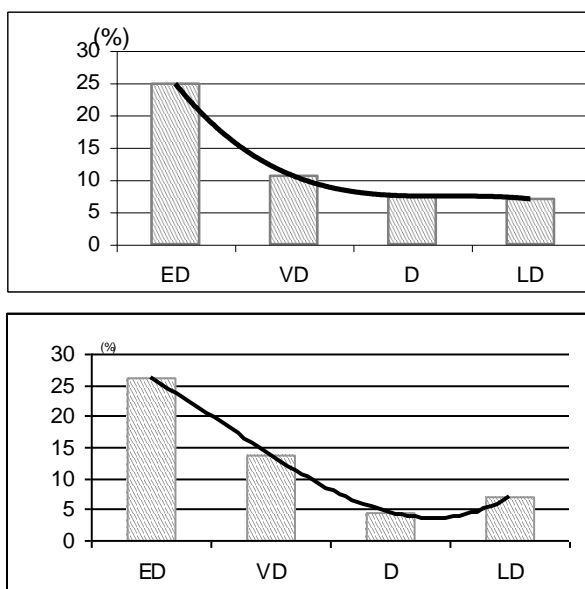


Fig. 6 Pluviometric deficit (%) in July within the Oltenia Plain (above) and the Southern Dobroudja Plateau (below)

In July, within the Southern Dobroudja Plateau, the general mean percentage of the months with pluviometric deficit was 51.3%, higher than within the Oltenia Plain with about 2%. The values oscillated between 43.8% at Adamclisi and 62.5% at Constanța (a deviation of about 9%), which means a greater homogeneity than within the Oltenia Plain.

The general percentage of excessively dry months was 26.2% (Fig. 6), also about 2% higher than within the Oltenia Plain, while territorially, it varied between 22.5% at Constanța and 29.2% at Hârșova (deviation of about 7%), in the north-east of the studied area, the previous conclusion being available in this case too.

The general percentage of very dry months within the Southern Dobroudja Plateau was 13.8%, namely almost half of the excessively dry months and only about 2% higher than within the Oltenia Plain.

The percentage of the months with complex drought was 39.9% (about 40%), about 5% higher than within the Oltenia Plain; the values varied between 33.4% at Adamclisi and 47.5% at Constanța (deviation of about 14%), indicating a lower variability than within the Oltenia Plain, where the deviation is of about 19%.

The general percentage of the months with moderate drought (MD) is 11.3% (less than 1/3 of that of the months with complex drought), about

1.2% lower than that registered within the Oltenia Plain; territorially, the percentages oscillated between 8.3% at Hârșova and 15.0% at Constanța (deviation of about 7%) indicating a lower variability than within the Oltenia Plain.

We may conclude that *the number of the months with pluviometric deficit within the Southern Dobroudja Plateau is greater than within the Oltenia Plain*, as well as the number of the months with complex drought.

In August (Fig. 7), within the Oltenia Plain, the general mean percentage of the months with pluviometric deficit for the entire area was 54.9% (more than half of the total number of analysed months). In the territory, the percentage oscillated between 45.8% at Caracal and 62.5% at Bechet, the deviation being of 16.7%. Compared to July, it was higher, which emphasizes that summer drought increases and becomes persistent in August.

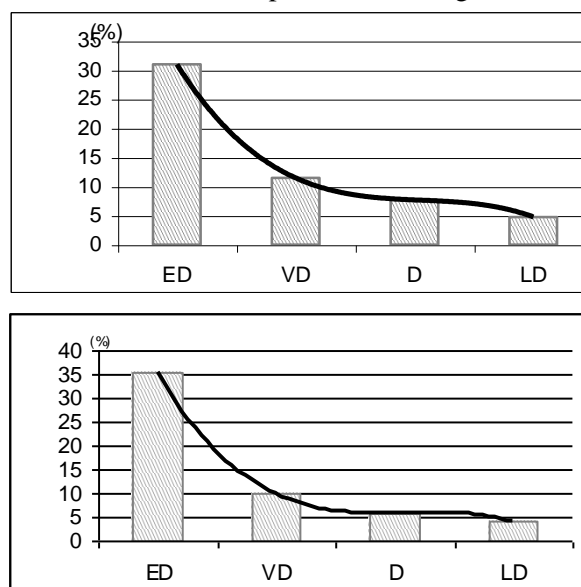


Fig. 7 Pluviometric deficit (%) in August within the Oltenia Plain (above) and the Southern Dobroudja Plateau (below)

The general mean percentage of excessively dry months was 31.0% (Fig. 7), (a little more than ¼ of the total number of months), while within the territory, the percentage oscillated between 25.0% at Slatina and 37.5% at Bechet, located in the southern extremity of Oltenia (a deviation of 12.5%).

The general mean percentage of very dry months was 11.5% (less than half of the excessively dry months); the percentage varied between 8.3% at Caracal and Craiova and 14.6% at Calafat and Bechet.

The general mean percentage of the months with complex drought reached 42.4%, while at the meteorological stations it was comprised between

34.4% at Slatina and 52.1% at Bechet (deviation of about 17%).

The general mean percentage of the months with moderate drought was 12.4% (about 1/3 of the percentage of months with complex drought); for the stations, it varied between 6.3% at Caracal and 20.8% at Craiova (deviation of about 14%).

In August (Fig. 7), within the Southern Dobroudja Plateau, the general mean percentage of the months with pluviometric deficit reached 55.0%, namely approximately equal to the one registered within the Oltenia Plain; the pluviometric deficit varied between 50% at Constanța and Hârșova and 60.4% at Mangalia and Adamclisi. All the values exceeded $\geq 50\%$; the deviation was 14%, lower than within the Oltenia Plain, which means a smaller variability.

The general mean percentage of excessively dry months was 35.34%, about 5.3% higher than in Oltenia, while within the territory, it was comprised between 33.4% at Medgidia and 37.5% at Adamclisi (deviation of 4%), thus emphasizing a lower variability. The general mean percentage of the months with complex drought (CD) was 45.16%, about 3% higher than within the Oltenia Plain. The monthly percentage values of complex drought were between 42.5% at Constanța and 47.9% at Adamclisi, with a deviation of about 5%.

The general mean percentage of the months with moderate drought was 9.84%, about 35% lower than that of complex drought (and 2% lower than within the Oltenia Plain). In the territory, the percentage held by the months with moderate drought oscillated between 6.3% at Hârșova and 14.6% at Mangalia, increasing from north-west to south-east to more than double. This means that, within the Southern Dobroudja Plateau **complex drought predominates in the last summer month**; as a general conclusion, in August **one of two months registers pluviometric deficit**.

In September (Fig. 8), within the Oltenia Plain, the general mean percentage of the month with pluviometric deficit for the entire territory was 52.1%, a little lower than that registered in August (with 2.8%); the values oscillated between 43.8% at Craiova and 64.6% at Bechet.

The general mean percentage of the excessively dry months was 33.3% (about 1/3 of the total number of months), namely about 2% higher than in August. At the meteorological stations it varied between 25.0% at Dr. Tr. Severin and 43.8% at Bechet, with a deviation of about 19%.

The mean percentage of very dry months was 10.7% (about three times lower than that of the excessively dry months); at the meteorological

stations, the percentage oscillated between 6.2% at Bechet and Slatina and 18.8% at Băilești, with a deviation of about 12%.

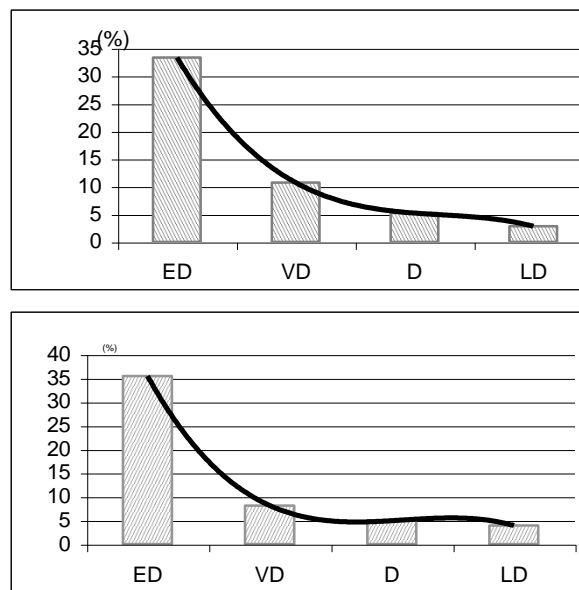


Fig. 8 Pluviometric deficit (%) in September within the Oltenia Plain (above) and the Southern Dobroudja Plateau (below)

The general mean percentage of the months with complex drought was 44.1%, namely about 8% lower than that of the months with pluviometric deficit, which offers us *an image regarding the extension of the months with complex drought*. The percentages of the months with complex drought oscillated between 37.5% at Slatina and 50% at Calafat, Băilești, and Bechet, with a deviation of about 13%. We notice the increased frequency of the months with complex drought within the entire plain.

Moderate drought registered relatively low percentages (about 8%).

We may conclude that **in the last summer month and the first autumn month there are the most numerous months with pluviometric deficit, and after the installation of drought it evolves rapidly and becomes complex drought affecting the entire Oltenia Plain**.

In September (Fig. 8), within the Southern Dobroudja Plateau, the general mean percentage of the month with pluviometric deficit reached 52.4%, approximately equal to that from the Oltenia Plain. Within the territory, the months registering pluviometric deficit oscillated between 43.8% at Adamclisi and 62.5% at Medgidia (a deviation of about 19%). The second value was 56.3% at Mangalia marking an important precipitation deficit in the seashore area. We also notice that the maximum percentage in Dobroudja reached 62.5% at Medgidia, but it is lower than the maximum values from Oltenia, which reached 64.6% at Bechet, situation induced

especially by the climate evolution in the last two-three decades (Bogdan, Marinică, 2009).

The general percentage of the excessively dry months was 35.4%, about 2% higher than within the Oltenia Plain. Within the territory, it varied between 25.0% at Constanța and 43.8% at Medgidia, with a deviation of 18.8%, the previous conclusion being still available.

The general percentage of very dry months was 8.1%, about 2% lower than in Oltenia 2%, while at the stations, it varied between 6.2% at Hârșova and 10.4% at Mangalia, with a deviation of about 4%. This aspect confirms the great uniformity registered within the Southern Dobroudja Plateau.

The general percentage of the months with complex drought was 43.6%, approximately equal to that registered within the Oltenia Plain. Territorially, the percentage varied between 32.5% at Constanța and 52.1% at Mangalia and Medgidia, with a deviation of about 20%.

The general mean percentage of the months with moderate drought was 8.9%, namely a little higher than in Oltenia (just 0.8%), while at the stations, it varied between 4.2% at Mangalia and 15.0% at Constanța, with a deviation of about 11%.

CONCLUSION

Within both studied areas, the months with pluviometric deficit registered quite different percentage values.

Within the Oltenia Plain, the driest months, in a decreasing order of the general percentage values are: May, August (54.9%), June, September (52.1%), July (49.9%), and April (45.0%).

Within the Southern Dobroudja Plateau, the driest months, in a decreasing order of the general percentage values are: May (57.3%), August (55.0%), June (52.5%), September (52.4%).

The relief structure and its interaction with the general circulation of the atmosphere, the geographical location and the multiple climatic influences decisively contribute to explaining the differences mentioned in the paper.

Within the Southern Dobroudja Plateau, although the values seem to be comparable to the ones registered within the Oltenia Plain, pluviometric deficit is more acute and droughts are more intense, due to the lower multiannual amounts of precipitation.

The increased frequency of excessively dry weather is the results of the influences of the continental anticyclones registered during the entire year (but especially in summer, winter, and the

beginning of autumn), as well as of the Black Sea, which contributes to the diminution of the precipitation amounts. Thus, within the Southern Dobroudja Plateau, we may state that “the normal state is drought”.

Within the Oltenia Plain, there are noticed both months and years with pluviometric deficit. The effects of the deficit are severely felt especially during the warm season, when the maximum temperature values are high, there are dog days, and the water reserve in the soil decreases to the wilting point.

Within the Southern Dobroudja Plateau, the general mean percentage of the months with pluviometric deficit, for the entire studied period of about half a century, is 53.3% (52.9% for the warm season), while within the Oltenia Plain, it is 49.4% (respectively 51.4% for the warm season). Consequently, *the aforementioned percentages (both for annual values and the values registered in the warm season) reflect a clear tendency of climatic aridization in both regions, tendency which is however more clear within the Southern Dobroudja Plateau.*

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