UDK: 556.1:556:53(497.782)

HYDROGRAPHIC CHARACTERISTICS OF THE BASIN OF MALA REKA (VOLCHICA – CRNESHNICA – MALA REKA)

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ABSTRACT

The Basin of Mala Reka (Little River) is located in the Poreče region. Mala Reka is a left tributary of the river Treska and generally extends towards the northwest – southeast. Springs are on the massif of Dobra Voda – Suva Gora, near the crossing Peklishte and it flows in the river Treska near the village Kalugjerec.

In this article besides the geographical position and the traffic con-nection, are detailed the hydrographic characteristics (spring, flow, length, river network, stream frequency, total decline, average decline, watershed, average watershed, watershed line, area of the basin, shape of the basin, length of the basin, average width of the basin, elongation ratio, circulatory ratio, average height of the basin, hypsometry of the basin and asymmetry of basin) on the basin of Mala Reka, and there are given more indicators of the largest tributaries.

Key words: hydrography, river network, river profile, Mala Reka.

GEOGRAPHICAL POSITION AND TRAFFIC CONNECTIONS

The Basin of Mala Reka is located in the middle course of the river Treska, more exactly in northwest part of the Porece Basin. The East side of the basin is surrounded by ridges Shatoroec, Sedlo (1212 m), Vron (1176 m) and Fojnik (1421 m), the north is surrounded by mountain Suva Gora (Dupen Kamen 1.857 m), the west side is completely surrounded by Dobra Voda (2061 m) and on the south spans a branch Straznic (1049 m). The Basin of Mala Reka generally extends north-west – southeast, while this direction deviates only downstream, where the direction of stretching changes to the east. The most Eastern point in the basin of Mala Reka is flow of Mala Reka in the river Treska with coordinates 41º 40' 05" N and 21º 15' 02" E, and the most western point is located on the mountain Suva Gora, near the top Dupen Kamen (1857 m) which has coordinates 41 º 44 '51 "N and 21 º 24' 41" E. The most northern point in the basin is located on the mountain Su-va Gora, on top Guri Isacut (1799 m), with coordinates 41º 47 '32 "N and 21º 05' 24" E, while the most southern point is located on the mountain Dobra Voda, on top Belezi (1816 m), with coordinates of 41º 37 '48 "N and 21º 06' 05" E. The distance between the most west-ern and the most eastern point is 23.9 km, while the distance

between the most northern and the most southern point is 18 km[1]. The Highest point in the basin of Mala Reka is the top Dobra Voda (2061 m), while the lowest point is the flow of Mala Reka into river Treska (470 m). The height difference between these two points is 1591 m.

In terms of traffic connections, the basin of Mala Reka has no fa-vorable position compared to most roads in the Republic of Macedo-nia. The only significant road is a local road in 2132 (Kalugjerec - Samokov - Rastesh); this road near the village Kalugjerec is connected to the regional road Skopje – Makedonski Brod (R 1106). The road to Makedonski Brod is paved with two lanes, but the other part to Skopje is still not completed, a large portion is covered in grav-el. Also, road traffic, but for off-road vehicles can take place on macadam road through the passage Peklishte (1.370 m), where the basin is associated with the town of Gostivar. A similar traffic can be realized by mac-adam road Trebovle - Blizansko, where the road connects with regional road 1106 (Skopje - M. Brod).

HIDROGRAPHIC CHARACTERISTICS

Mala Reka is the left and the longest tributary of the river Treska. It flows into the river Treska in the central part of the Poreche Basin. Mala Reka is formed by three rivers which meet in the village of Samokov (near the hotel Porechki Biser). On one side there are the merging riv-ers Bencheska and Kovachka, then this stream flow joins the river Crneshnica and down the stream is known as Mala Reka. Often, the river Crneshnica which arises by merging rivers Volchica and Bi-tovchica is named, and it is a carrier of Mala Reka, which to an ex-tent is justified because this river has the longest watercourse (stream) in comparison to the Benche – Kovach River. The spring of water-course Mala Reka – Crneshnica is river Volchica, which is located on the eastern slopes of the mountain range Dobra Voda – Suva Gora (near the crossing Peklishte) at an altitude of 1.460 m. The confluence of the Mala Reka is located near the village Kalugjerec at an altitude of 470 m.



Figure 1: Composition of Benche – Kovac river (left)
and river Crneshnica (right) – creating a Mala Reka

[1] Calculations in the program Golden Surfer, on topographic map 1: 100 000 sheet Skopje 731



Figure 2: The flow of Mala Reka into river Treska

Length. The measurement of a section from a topographic map 1:100 000, on the sheet of Skopje, has shown that the length of Mala Reka, from its formation at the village of Samokov to its flow into the river Treska is 12.6 km. While together with the spring rivers Crneshni-ca (7.93 km) and Volchica (10.07 km) it has length of 30.6 km. The minimal length on the river flow measured straight from the spring to the flow is a 21.44 km, while the coefficient of development of the river flow (the relationship between the real and the minimum length) is 1.42[2].

River Network. The river network in the basin of Mala Reka is consisted of totally 122 regular, periodic and temporary watercourses, which have a total length of 245.8 km. From them, 122 watercourses or 86.52% are with length smaller than 2 km (total length of 131.9 km), 11 watercourses are with length of 2-5 km (total length of 33.5 km), 7 watercourses are with length of 5-10 km (total length of 49.76 km) and only the main watercourse (Volchica – Crneshnica – Mala Reka) has a length greater than 10 km. [2] Otherwise watercourse of Ma-la Reka has 45 direct inflows (21 right and 24 left), most of them are periodic and temporary watercourses. 7 tributaries are especially im-portant, two left and five right tributaries. The left tributary rivers are: Trebovska and Brestovska. Right tributaries are: Bitovska, Botushka, Benche – Kovach River, Petroa and Incheska (Stanskoski, 1966). Ac-cording to the angles of inflow of the tributaries in Mala Reka it may be noted that the basin has a dendroid type of river network. Accord-ing to the classification of the streams order proposed by Shtraler (1964)[3], at the Basin of Mala Reka 4 of sreams (watercourses) order can be allocated. The first order of streams without tributaries, have a total length of 153.93 km, the second order of streams has a length of 39.45 km, the third order is composed of 7 streams with a length of 30.52 km, while the last (fourth) order is composed only of the flow (Mala Reka) which has a length of 21.9 km.

[2] Calculations in the program Golden Surfer, on topographic map 1: 100 000 sheet Skopje 731

[3] Suzanne M. Pierson, Barbara J. Rosenbaum, Lucinda D. McKay, and Thomas G. Dewald (2008) Strahler Stream Order and Strahler Calculator Values in NHD Plus, USA

Table 1: Order of watercourses and their length

Order of watercourses	Number of watercourses	Length of all watercourses (km)
1	141	153.93
2	30	39.45
3	7	30.52
4	1	21.9
Total	**141**	**245.8**

Stream Frequency. The stream frequency (FS) is the relationship between the number of tributaries (N) and area of the basin (A) ex-pressed in km^2 (Horton 1945)[4]. On basin of the Mala Reka, stream frequency is 0.75 on km^2. Coefficient of the stream frequency is big-ger on right side on valley where is 0.79 on km^2 (96 watercourses on area of 121.4 km^2), and the same on left side is 0.66 on km^2 (44 water-courses on area of 66.60 km^2).

The density of the river network depends on several factors, among which the most important are climate (rainfall), geological structure and topography, and to a lesser extent, vegetation cover (Dukic, Gavrilovic, 2008). **The density coefficient of the river network** according to Neuman is the ratio between the total length of all watercourses and the surface of the basin. Density coefficient of the river network in the basin of Mala Reka is 1.30 km/km^2. Right tributaries of Mala Reka have higher density of river network and the coefficient is 1.37 km/km^2. While the density coefficient of the river network of the left tributaries is 1.33 km/km^2. [5] The density of the river network is the highest in the lower basin where it is 1.59 km/km^2. The following tributaries have the biggest density of river network: Incheska 1.88 km/km^2, Bitovchica (Bitovska) 1.61 km/km^2, Brestovska 1.56 km/km^2, and river Petroa 1.56 km/km^2.

Total decline. The total decline is the height difference between the elevation of the spring and level of confluence, expressed in meters (Dukic, Gavrilovic, 2008). The total decline of Mala Reka is 990 m. The following rivers (tributaries) of Mala Reka have a greater total de-cline: Kovachka (1215 m), Petroa (1195 m), Botushka (1042 m) and river Bencheska (1015 m).

Average decline. The average decline is estimated as the ratio between the length and the total decline of the watercourse, and can be expressed in m/km or ‰ (Dukic, Gavrilovic, 2008). The size of the average decline depends on the speed of leakage of water from the watershed, erosion, hydropower potential and ect. (Dimitrovska 2010). Mala Reka`s average decline is 32.39 m/km. Greater average decline than Mala Reka have the rivers (tributaries): Brestovska (189 m/km), Petroa (163.6 m/km), Botushka (127 m/km), Bitovshica (123.2 m/km), Trebovska (92.9 m/km) and the river Incheska (92.7 m/km).

Longitudinal river decline. The longitudinal decline on Mala Reka`s watercourse (Volchica – Crneshnica – Mala Reka) is not equal everywhere. On order to get a more accurate representation, it can be divided into several parts, such as the general division into three parts (upper, middle and lower flow). The relative decline is the greatest in the upper flow, from the spring of the river Volchica (1460 m) to the confluence of the river Trebovska

[4] Horton R. (1945): Erosional development of streams and their drainage basins: hydrophysical approach to quantitative morphology, Bulletin of the Geological society of America

[5] It is obtained by area of the basin of right or left tributaries without the main watercourse and immediate basin

(770 m) while the same of length of 8.64 km has decline of 79.86 m/km. In the middle and lower flow of the watercourse, Mala Reka has almost flat character, while the section from the estuary of the river Trebovska to the composition of rivers Crneshnica with Benscesko – Kovacka (Rastesh - Samokov), at a length of 9.37 km has a decline of 15.47 m/km and from village Samokov to the confluence of the Mala Reka, at a length of 12.6 km it has a relative decline of 9.19 m/km.

Table 2: Longitudinal river profile on watercourse of Mala Reka

	Part of watercourse	First point m	Last point m	Total decline m	Length km	Relative decline m/km
1	Spring of river Volchica - flows of river Trebovle	1460	770	690	8,64	79,86
2	Flows of river Trebovle – flows of Bitovchica	770	715	55	1,37	40,14
3	Flows of Bitovchica – flows of Botushka	715	668	47	2,23	21,07
4	Flows of Botushka – flows of Brestovska	668	635	33	2,15	15,34
5	Flows of Brestovska – conjunction with river Benche/Kovach	635	585	50	3,55	14,08
6	Sonjunction with river Benche/Kovach – flows of Petroa	585	545	40	3,3	12,12
7	Flows of Petroa – flows of river Incheska	545	525	20	2,2	9,09
8	Flows of river Incheska – flows in river Treska	525	470	55	7,1	7,74

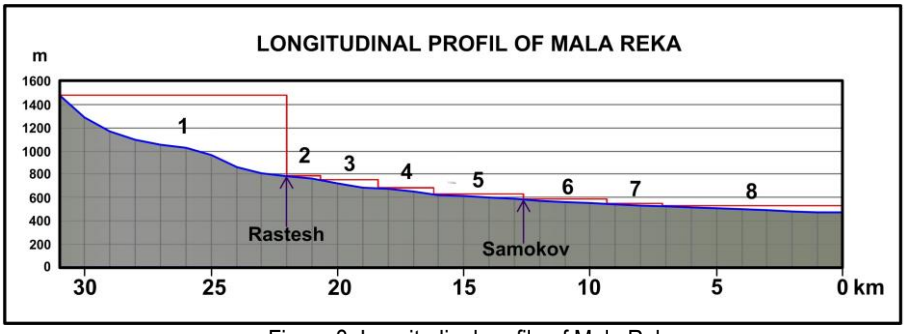


Figure 3. Longitudinal profile of Mala Reka

Watershed. The watershed represents the most elevated part of the land from which storm water is divided into two adjacent or opposite rivers.[6] The watershed of Mala Reka is made up by the ridges Shatoaroec, Sedlo, Vron and Fojnik, mountain Suva Gora (Dupen Kamen, 1,857 m), mountain Dobra Voda (2061 m) and ridges Straznik. Starting from the flow to the north watershed climbs on the hill Pesh (749 m), there continues to the ridge Shatoaroec (Veli Vrv,

[6] Peter E. Black (1996) Watershed hidrology, second edition, New York

1,083 m), then down to elevation 888 m, where it bypasses the mountain flattening Podishte, and then it clims again, this time at the top Sedlo (1,212m). From here the watershed continues to the tops Kula (1,183 m) and Vron (1,176 m), from which it descends to the village of Brest, again rises towards the top Fojnik (1,421 m). From the top Fojnik watershed moves northwest around to the village Trebovle and goes to the top Orlo Kule (1,102 m), and from this peak it moves to Suva Gora. It climbs an elevation of 1,546 m, over the karst field „Zivkovi Dupki" it continues to the top Guri Isaqut (1,799 m), leaving the karst field out of the hipsommetric basin of Mala Reka. In the sequel watershed moves to the ridge of Suva Gora towars the highest peak of this mountain – Dupen Kamen (1,857 m). From here it descends towards the passage Peklishte (1,370 m). From this crossing, the watershed continues to the ridge of the mountain Dobra Voda first climbs on top Limunje (1,840 m), then at the highest peak of this massif Dobra Voda (2,061 m). From this remarkable peak the watershed descends to the passage Belezi and climbs the eponymous peak, and from there down to the ridge Kitka it crosses between the villages Sushica and Tomino Selo. In the sequel, the watershed goes to the top Straznik (1,049 m) and continues to east to the peak Kiska (1,023 m). From this peak it descends to the village of Mogilec and evades the village, which remains outside the basin and climbs the hill Avalija (821 m), and despite the village Kalugjerec it descends to the confluence of the Mala Reka into the river Treska.

More significant mountain peaks that are seen on the watershed are the following: Fojnik (1,421 m), Guri and Isaqut (1,799 m), Dupen Kamen (1,857 m), Limunje (1,840 m), Dobra Voda (2,061 m), Straznik (1,049 m) and Kiska (1,023 m). More important crossings on the watershed are: the crossing on the village of Brest (950 m), Orlo Kjule (1,050 m), Peklishte (1,370 m), Gospodova Cheshma (1,610 m), Belezi (1,694 m) and the crossing Sokaloec (910 m), between the villages Sushica and Tomino Selo.

Average height of the watershed. This parameter is calculated as an arithmetic average of the average height of the peaks (Hsr) and the average height of the crossings (hsr) excelling on watershed. [7] When calculating the ratio between all significant peaks and crossings, we obtained that the average height of the watershed is 1229.8 m.

Definite and indefinite watershed. Definite water leakage is found in places where the watershed is built not by water permeable rocks (schist, metasandstone, granite and ect.), while indefinite leakage occurs in spaces built of carbonate rocks (dolomite, dolomitic limestone and dolomitic marbles). (Dimitrovska, 2013). Definite watershed clearly is met on the southern, southwestern and western parts of the watershed and in the area from the ridge Straznik, mountain Dobra Voda, up to the crossing Peklishte. Indefined leakage of water is characteristic of the northern, northeastern and eastern parts of watershed, in the direction north of the Peklishte crossing, mountain Suva Gora, through the ridge Fojnik, Sedlo, up to the ridge Shatoroec. The indefinite watershed is mostly intertwined on the mountain of Suva Gora, where karst is represented and there are more depressions (Dupen Kamen – Guru Isaqut) and a karst field (Zivkovi Dupki). Moreover, the watershed is difficult to determine in the area of mountain flattening – Podishte, near the village Ramne.

[7] Dukic D., Gavrilovic L. (2008): Hydrology,Belgrade

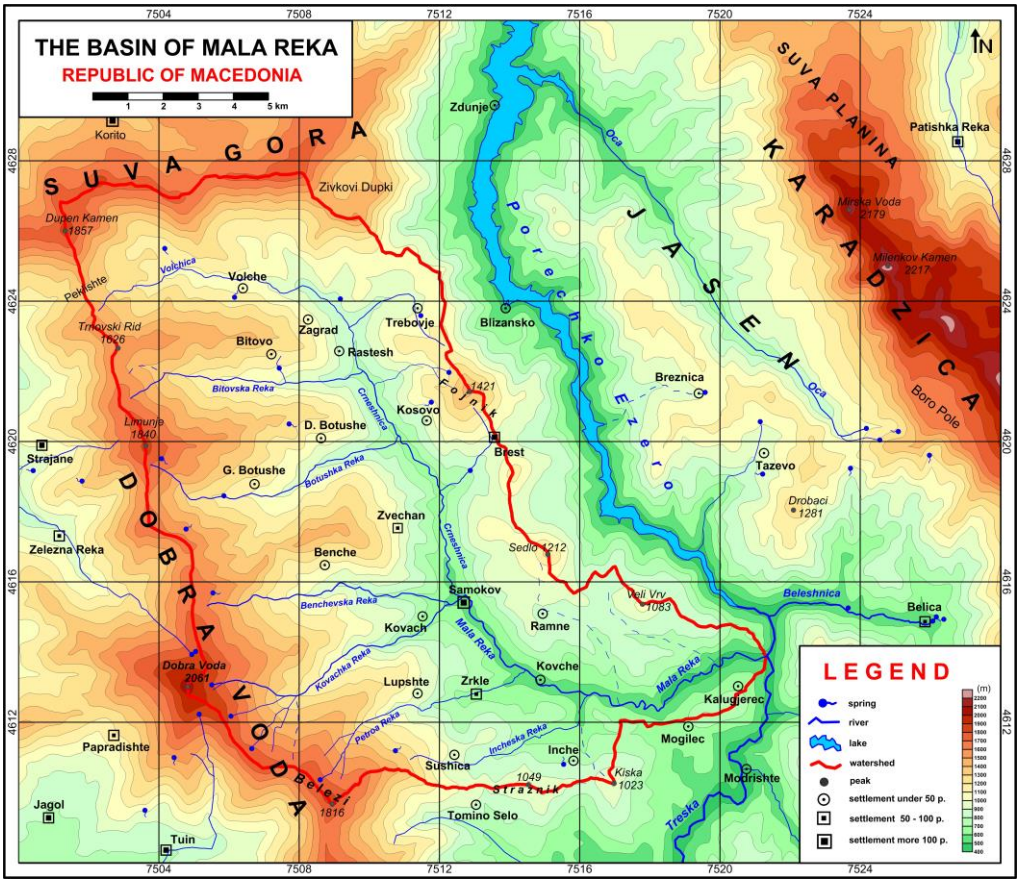


Figure 3: The basin of the Mala Reka

Watershed line and coefficient of development of the watershed line. The watershed line is imagined as a mathematical line connecting the highest points of watershed and shares of the storm water into two opposing basins (Dimitrovska O, 2010). The basin of the Mala Reka has a watershed line in length of 69.86 km. The length of the watershed line is almost equally represented on both sides,while the left side is 0.84 km greater than the right side and has a length of 35.35 km. [8]

The basin area. The area of the basin of Mala Reka is gained by electronic measurement on a segment of a section from a topographic map 1:100 000, sheet of Skopje, and these calculations show 188 km^2 or 9.08 % of area of the basin of river Treska. The area is not equally distributed, the majority is found on the right side, which covers an area of 121.4 km^2 or 64.57%. The left area is with a size of 66.60 km^2 or 36.43% of total basin. [9] The basin of Mala Reka can be divided into three parts: upper, middle and lower basin. The area of the upper basin coincides with the original basin of the rivers Bitovchica and Volchica and it covers

[8] Calculations in the program Golden Surfer, on topographic map 1: 100 000 sheet Skopje 731

[9] Calculations in the program Golden Surfer with digitization of an excerpt from a topographic map 1: 100 000, sheet Skopje 731 and digital calculations

an area of 58.39 km^2. The middle basin covers along the rivers Crneshnica and river Benche – Kovach, 78.97 km^2 or 42 % of the total area belong to this area. The lower basin extends east of the village of Samokov or from the junction of the rivers Crneshnica and river Banche – Kovach, downstream to the flow of Mala Reka, and this part covers an area of 50.64 km^2. The total area of all tributaries is 158.13 km^2 and 105.58 km^2 to the right tributaries and 52.55 km^2 on left tributaries.The total area of the immediate basin of watercourse of Mala Reka is 29.87 km^2 or 15.88% of total area. The area of immediate basin on the right side is 15.82 km^2, while of left side is 14.05 km^2. Tributaries (rivers) with bigger basins are the followng: Benche – Kovach River 31.39 km^2, river Botushka 22.21 km^2 н and river Bitovshica (Bitovska) 15.76 km^2. [10]

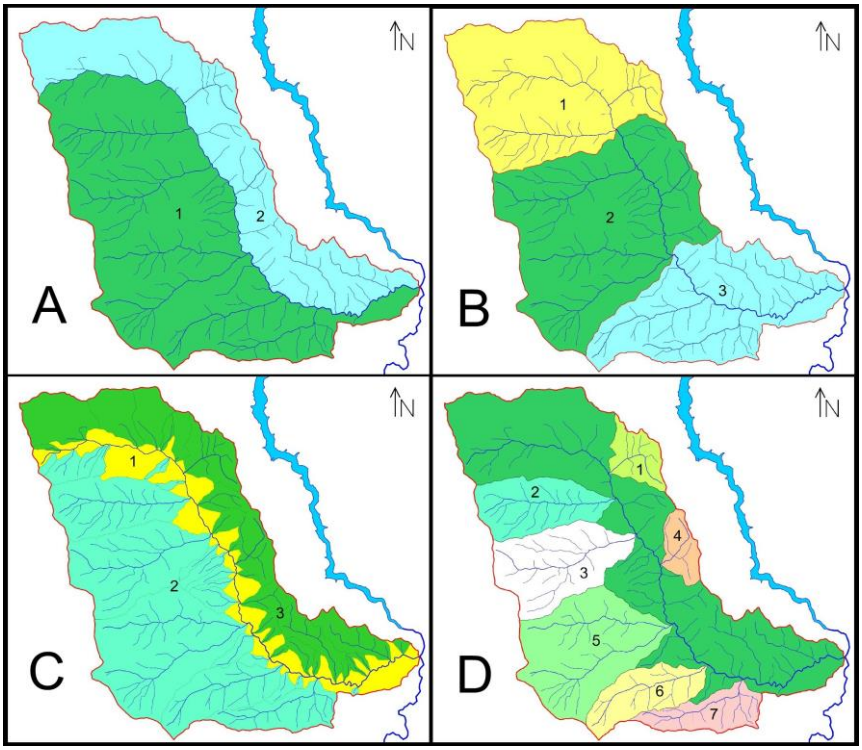


Figure 4: **A** – Right (1) and left (2) side of the basin; **B** – Upper (1), middle (2) and lower (3) basin; **C –** Immediate basin (1), right (2) and left (3) tributaries; **D** - The largest tributaries of Mala Reka (Little River), Trebovska River(1), Bitovchica (2), Botuchska River (3), Brestovska River (4), Benche – Kovach River (5), Petroa River (6), Incheska River (7);

[10] Calculations in the program Golden Surfer with digitization of an excerpt from a topographic map 1: 100 000, sheet Skopje 731 and digital calculations

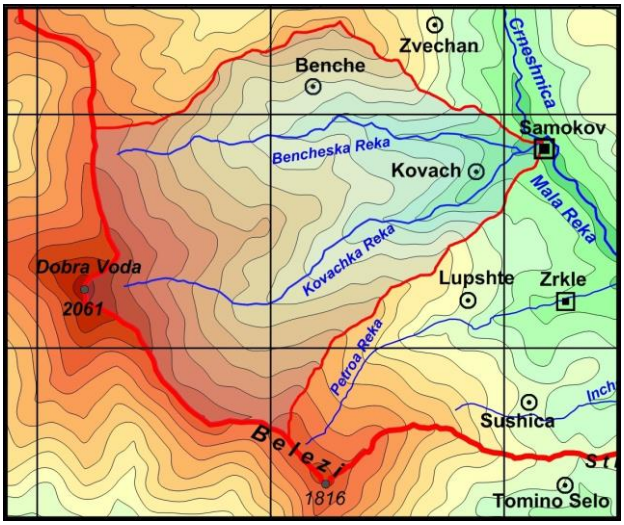


Figure 5: Basin of Benche and Kovach River

Table 3: Basic hydrographic indicators (left or right tributary, constant or periodic watercourse, point of spring, point of flows, total decline and average decline) on tributaries of Mala Reka (Volchica – Crneshnica – Mala Reka)

Number of tributary	Tributary	Left/right tributary	Constant/ periodic watercourse	Point of spring m	Point of flows m	Total decline m	Average decline m/km
1.	Trebovle River	left	constant	1140	770	370	92,9
2.	Bitovchica (Bitovo River)	right	constant	1590	715	875	123,2
3.	Botushka River	right	constant	1710	668	1042	127
4.	Brestovska River	left	constant	1240	635	605	189
5.	Benche – Kovach River	right	constant	1810	585	1225	144,1
	Benche River	/	constant	1610	595	1015	135,3
	Kovach River	/	constant	1810	595	1215	151,8
6.	Petroa River	right	periodic	1740	545	1195	163,6
7.	Incheska River (Sushica River)	right	periodic	1090	525	575	92,7

Table 4: Basic hydrographic indicators (length, min. length, area of the basin and wtershed line) on tributaries of Mala Reka (Volchica – Crneshnica – Mala Reka)

Number of tributary	Tributary	Left/right tributary	Length km	Min. length km	Area of the basin km^2	Watershed line in km
1.	Trebovle River	left	3,98	2,7	6,41	12,77
2.	Bitovchica (Bitovo River)	right	7,1	6,6	15,76	18,01
3.	Botushka River	right	8,2	7,1	22,21	21,18
4.	Brest River	left	3,2	2,5	5,14	10,22
5.	Benche – Kovach River	right	8,5	7,5	31,39	24,42
	Benche River	/	7,5	6,9	15,59	18,94
	Kovach River	/	8	7,1	15,64	20,10
6.	Petroa River	right	7,3	6,6	12,24	16,93
7.	Inche River (Sushica River)	right	6,2	5,3	9,42	16,96

Form of the basin. The basin of the Mala Reka is with an irregular form, which resembles the letter "L", which narrows in the lower part. According to the typology which is done by B.A. Apollo and N.V. Kotlovaja, the basin of the Mala Reka is ranked in rivers which have the greatest width of the basin in the middle reaches. While the **form coefficient** of the basin is 0.20.[11]

Length of the basin. The length of the basin of Mala Reka is determined by the length of the median, which is drawn on the map by means of a series of concentric circles (Dukic, Gavrilovic, 2008). In this way it is obtained that the basin has a length of 27.24 km. The length measured by length of the watercourse on the most exposed watershed to the estuary is 30.8 km. [12]

The average width of the basin is obtained by dividing the surface of the basin with its length (Dukic, Gavrilovic, 2008). The average width of the basin is 6.10 km. The right side of the basin of Mala Reka has an average width of 3.94 km, while the average width of the left valley side is 2.16 km.[13]

[11] Calculated with formula Rf = A / (Lb) 2; where, A = Catchment area, Lb = Length of the basin (Horton, 1932)

[12] Calculations in the program Golden Surfer with digitization of an excerpt from a topographic map 1: 100 000, sheet Skopje 731 and digital calculations

[13] Calculated with length of the watercours from flow to the farthest watershed.

Table 5: Average height of the basin of river Treska

Number of zone	Point of horizontal	F between horizontals (fi) km2	Average height (hi) in m	Product fi *hi
1.	470 – 500	0.72	485	349.2
2.	500 – 600	5.87	555	32,57,85
3.	600 – 700	11.54	655	7558.7
4.	700 – 800	15.40	755	11627
5.	800 – 900	20.93	855	17895.15
6.	900 – 1000	20.34	955	19424.7
7.	1000 – 1100	22.31	1055	23537.05
8.	1100 – 1200	20.60	1155	23793
9.	1200 – 1300	19.44	1255	24397.4
10.	1300 – 1400	15.88	1355	21517.4
11.	1400 – 1500	12.27	1455	17852.85
12.	1500 – 1600	9.51	1555	14788.05
13.	1600 – 1700	7.48	1655	12379.4
14.	1700 – 1800	4.43	1755	7774.65
15.	1800 – 1900	0.88	1855	1632.4
16.	1900 – 2000	0.27	1955	527.85
17.	2000 – 2061	0.04	2030.5	81.22
Total		**188**	/	**208 393.9**

Hypsometry of the basin. Hypsometry the basin of Mala Reka can be divided into seventeen zones with a height difference of 100 m. The biggest area has zone 1000 - 1100 m with an area of 22.31 km^2 or 11.86%, while the smallest is the highest zone 2000- 2061 m, on the top Dobra Voda which has an area of 0.04 km^2 or 0.02% of the basin.

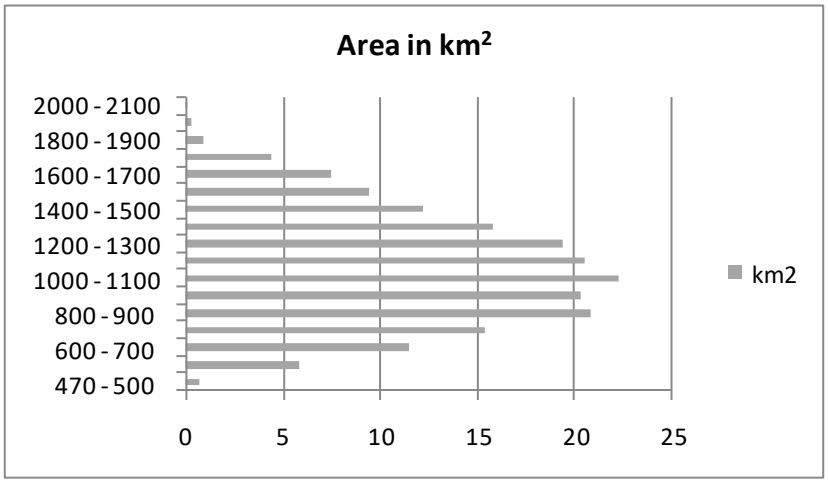


Figure 6: Graphic display of hypsometry representation at the basin of Mala Reka

Table 6: Hypsometry on area of the basin of Mala Reka

Number of zone	Height of zone m	Area	
		km²	%
1.	470 – 500	0.72	0.38
2.	500 – 600	5.87	3.10
3.	600 – 700	11.54	6.13
4.	700 – 800	15.40	8.19
5.	800 – 900	20.93	11.13
6.	900 – 1000	20.34	10.81
7.	1000 – 1100	22.31	11.86
8.	1100 – 1200	20.60	10.95
9.	1200 – 1300	19.44	10.34
10.	1300 – 1400	15.88	8.44
11.	1400 – 1500	12.27	6.52
12.	1500 – 1600	9.51	5.05
13.	1600 – 1700	7.48	3.97
14.	1700 – 1800	4.43	2.35
15.	1800 – 1900	0.88	0.46
16.	1900 – 2000	0.27	0.14
17.	2000 – 2061	0.05	0.02
Total		**188**	**100**

Coefficient of asymmetry. Coefficient of asymmetry is get as ratio between the surface of the left and the area on the right side of the basin (Dukic, Gavrilovic, 2008). The same is in the basin of Mala Reka 1.82 or the right side is almost twice bigger than the left one.

The coefficient of elongation ratio of the basin (Re) is the ratio between the area of basin (S) and length of the basin (Lb), and it is calculated by the formula $Re = 2\sqrt{(A / \pi)} / Lb$ (Schumn, 1956). In this way it is obtained that the basin of Mala Reka has a coefficient of elongation ratio which is 0.50.

The coefficient of circulatory ratio (Rc) is the ratio between the area of the basin (A) and the length of watershed line (P), and it is calculated by the formula $Rc=4\pi A/P^2$ **(**Miller, 1953). This parameter in basin of Mala Reka is 0.66.

The average height of the basin is obtained by calculating the area between two isohypses on map with a certain size and are divided by the total area of the basin (Vasileski 2001). When calculating with this parameter it is received that the basin of Mala Reka has an average elevation of 1108 m.[14]

CONCLUSION

The basin of Mala Reka (Little River) is located in the nort-west of the Poreche Basin. It is formed from three rivers in the village of Samokov. On one side are the merging rivers of Bencheska and Kovachka, then this stream flow is merged with the river Crneshnica and down the stream is known as Mala Reka. The watercourse Volchica - Crneshnica - Mala Reka has

[14] Calculations in the program Golden Surfer with digitization of an excerpt from a topographic map 1: 100 000, sheet Skopje 731 and digital calculations

the greatest length, so it was often used in our calculations. The length of Mala Reka is 30.6 km, which is the longest tributary in basin of the River Treska. The river network in Mala Reka watershed consists of 141 permanent, periodic and intermittent watercourses. 7 tributaries are especially important, two of which are left and five right tributaries. The stream frequency in basin of Mala Reka is 0.75 km^2, while the coefficient of the density of the river network is 1.30 km/km^2. The total decline of the water Volchica - Crneshnica - Mala Reka is 990 m, and the average decline is 32.39 m/km. The area of the basin of Mala Reka is 188 km^2 or 9.08% from basin of river Treska. The right side has an area of 121.4 km^2 or 64.57%, while the left side belongs to an area of 66.60 km^2 or 36.43% of the total basin.

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