
AUSTRIA
SLOVENIA
HUNGARY
SERBIA
CROATIA
Rjecina
Zvir
Gacka
BOSNIA
&
HERZEGOVINA
Jadro
ITALY
ADRIATIC SEA
MONTENEGRO
Ombla
Legend:
MIKAS
NIKAS
Karstifiable rocks
(potential karst aquifer)
Continuous carbonate rocks
Discontinuous carbonate rocks
WOKAM database;
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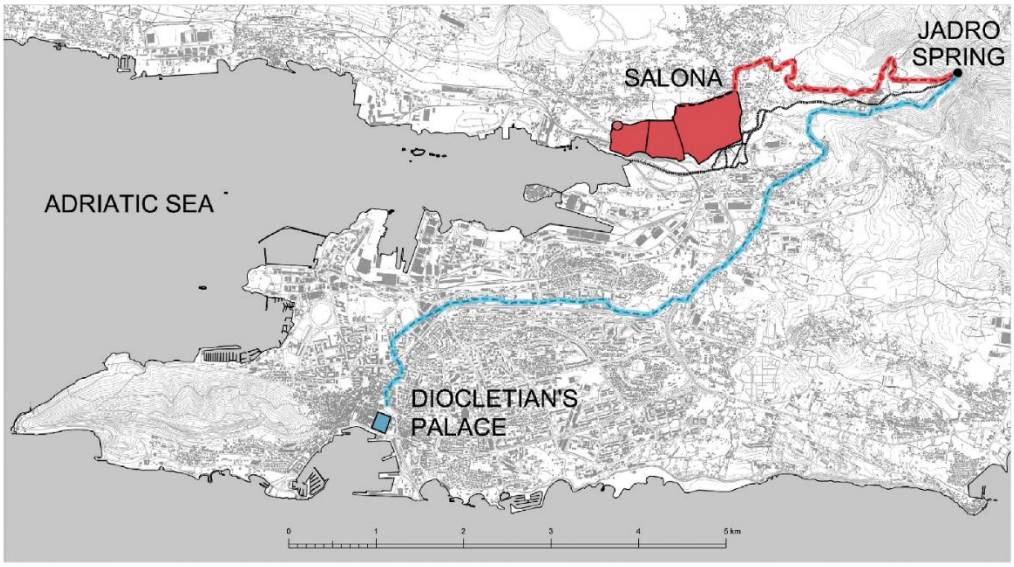
N
W
E
S
0
115
230
Km

Country	MIKAS springs	Coordinates / Nearby City	Spring discharge (Q in l/s,min/av/max) / tapped or not	Criteria* in order / Main justification */ H-historic, A-aesthetic, S-scientific, E-Economic, Ec-ecologic	Data collected by
Croatia 	1. **Jadro**	N 43° 32' 35" E 16° 31' 20" Z = 33 m asl Split, Dalmatian Coast of the Adriatic Sea	3.650 / 9.760 / 70.100 (For the period 1995-2021) Spring in use since ancient time. Firstly tapped in Roman time. Currently supplies potable water to the city of Split in the amount of 2000 l/s according to water permit.	***E, H, Ec, S, A,*** *Permanent, freshwater spring, which drains a large Cretaceous limestone transboundary aquifer (Croatia/Bosna &Herzegovina, Dinaric karst). It provides water for app. 300.000 inhabitants, and thousands of tourists during summer season. It forms a short karst river Jadro that has huge importance as a special ichthyological reserve from 1984, due to the existence of an endemic species Salmot obtusirostris salonitana. There were two aqueducts built: Salona aqueduct (with maximal capacity of 450 l/s), which has been in operation since the 1st century BC to VII. century, and the aqueduct of Diocletian's palace (with maximal capacity of 700 l/s), which was built in IV century AC. The latter was reconstructed at the end of the 19th century, and today more than half of its route is still in operation. The Jadro Spring is aesthetically valued for its clear turquoise water, karst landscape, lush vegetation, and peaceful natural setting, enhanced by its historical connection to ancient Salona.*	Maja Oštrić, Želimir Pekaš
	2. **Ombla**	N 42° 40’ 31” E 18° 08’ 14” Z = 2.5 m asl Dubrovnik, Dalmatian Coast of the Adriatic Sea	4.300/ 23.710 / 117.000 (For the period 1968-2012) Tapped out. Along with another spring Šumeta is a reason why ancient Dubrovnik (Ragusa) was built nearby. It supplies water for wider area of Dubrovnik city.	***E, S, Ec, H, A*** *The largest karst spring in Croatia. Permanent, freshwater spring, which drains a large, mostly Jurassic limestone transboundary aquifer (most basin is in Bosna &Herzegovina). It provides water for app. 90.000 inhabitants, and thousands of tourists in summer season. It represents locus typicus spring of the Dinaric karst. The significant anthropogenic interventions have been carried out in wider basin by construction of hydro energy system of Trebišnjica. The Vilina špilja – Ombla system is one of the species-richest speleological objects in Croatia and the Dinarides. Almost all of the cave fauna of this system is endemic. The cave is also Natura 2000 site. Ombla Spring is valued for its clear water, dramatic karst landscape, caves, rich biodiversity, and serene, scenic beauty.*	Maja Oštrić, Želimir Pekaš

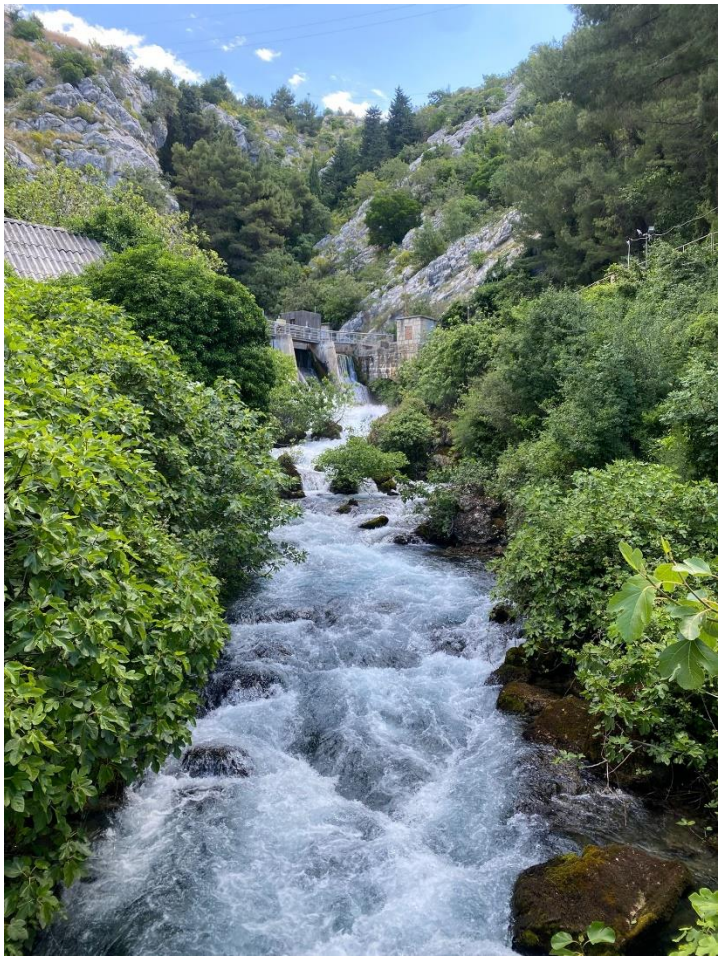
MIKAS – Jadro spring



Two Roman aqueducts; the Salona Aqueduct and the Diocletian Aqueduct (source: Marasović K & Margeta J, 2017)

Photo of Diocletian Aqueduct (https://www.petersommer.com/blog/archaeology-history/diocletians-palace-split-croatia)

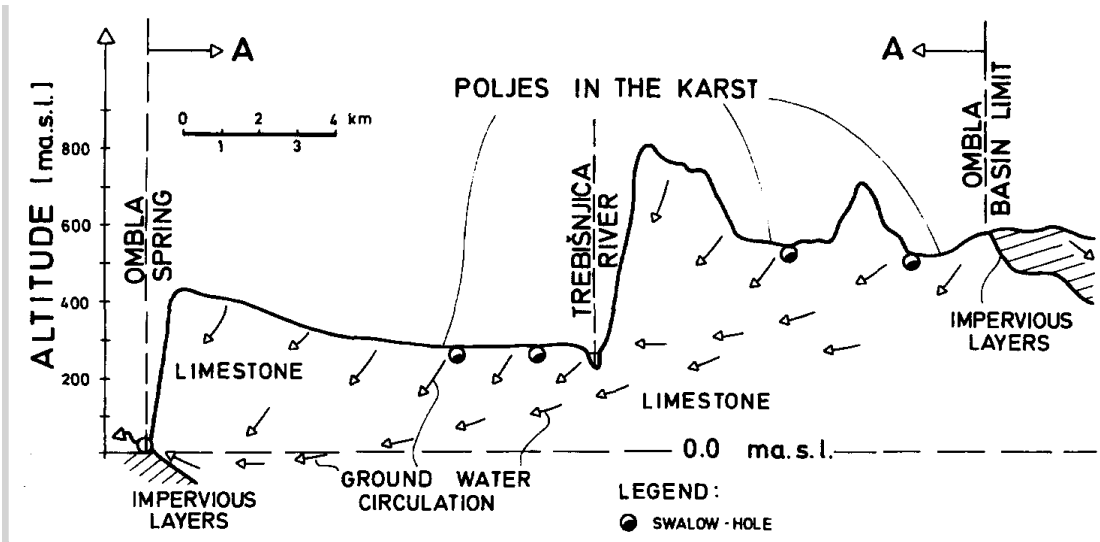
The water intake structures at the Jadro River's spring (photo: M. Žabčić)



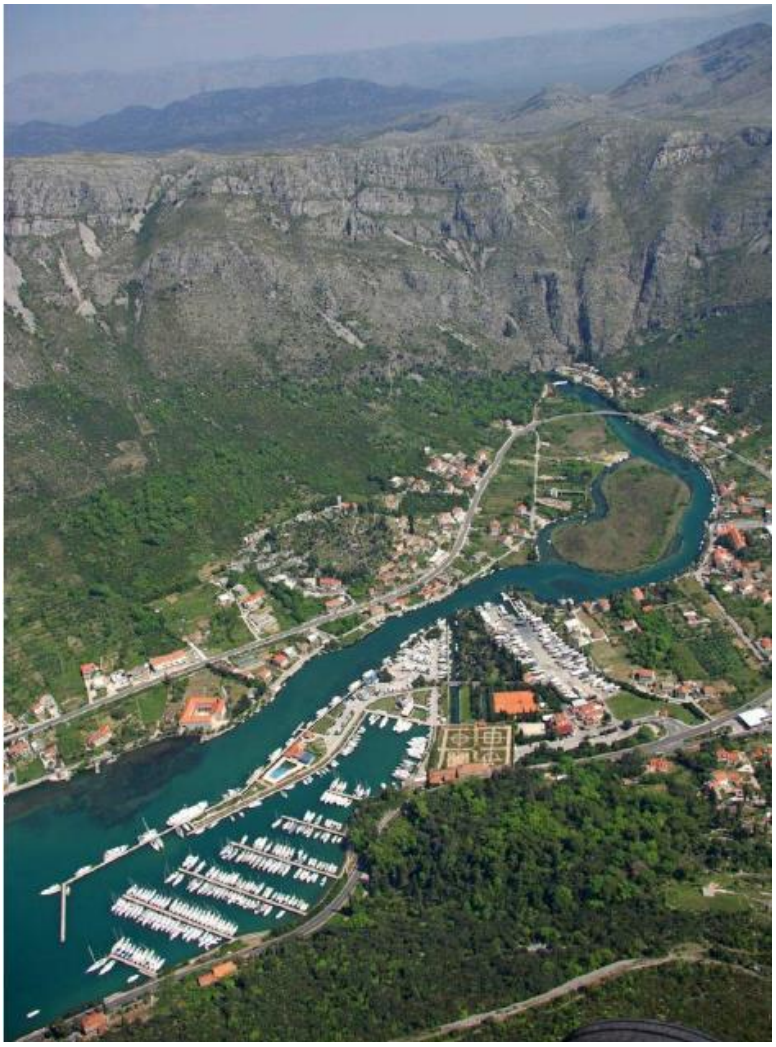
Jadro spring discharge in high water period (photo: Z. Stevanović)

MIKAS – Ombla

Location map showing supposed catchment area of Ombla spring with locations of springs (Ombla and Zaton), Trebišnjica River, the boundary limit between Croatia and Bosnia and Herzegovina, as well as the position of existing dams, reservoirs and HEPPs (From Bonacci T. and Bonacci O., 2013)



Cross section of Ombla spring and (from Bonacci, 1995)



Areal photograph of the Ombla Spring and surrounding area (taken by A. Maškarić), from Bonacci T.& Bonacci O., 2013.

Ombla spring originates the Dubrovačka Rijeka River (Photo: Z. Stevanović)