

= Zarqa River =

The Zarqa River (Arabic : نهر الزرقا , Nahr az Zarqa , lit . " the Blue River ") is the second largest tributary of the lower Jordan River , after the Yarmouk River . It is the third largest river in the region by annual discharge , and its watershed encompasses the most densely populated areas east of the Jordan River . It rises in springs near Amman , and flows through a deep and broad valley (which is identified with the biblical Jabbok River) into the Jordan , at an elevation 1 @, @ 090 metres (3 @, @ 580 ft) lower . The river is heavily polluted and its restoration is one of the top priorities for the Jordanian Ministry of the Environment .

The Zarqa River is commonly identified with the biblical Jabbok River (Hebrew : נחל יבוק , Nahal Yabok) .

Geologically , the Zarqa River is about 30 million years old . At the river 's origin is ' Ain Ghazal , a major archaeological site that dates back to the Neolithic . Archeological finds along the course of the river indicate the area was rich in flora and fauna in the past . The Zarqa River is well known for its amber deposits that date back to the Hauterivian era of the Early Cretaceous (135 m.y.) . A remarkable flora and fauna was reported from this amber reflecting tropical paleoenvironmental conditions prevailing during the time of resin deposition (Kaddumi , 2005 ; 2007) .

= = Name = =

The modern Arabic name , Nahr az Zarqa ' (نهر الزرقا) means " the blue river " , where nahr means river and zarqa ' (زرقا) means blue .

= = Biblical Jabbok = =

The Zarqa River is identified with the biblical river Jabbok (Hebrew : יבוק) . The Biblical Jacob crossed the Jabbok on his way back to Canaan , after leaving Harran . It leads west into the Sukkot Valley , from where one crosses over the Jordan and can easily reach Shechem , as Jacob eventually did . The biblical cities of Zaretan and Adam are also at the mouth of the valley .

The river is first mentioned in connection with the meeting of Jacob and Esau , and with the struggle of Jacob with the angel (Genesis 32 : 23 et seq .) . It was the boundary separating the territory of Reuben and Gad from that of Ammon (Deuteronomy 3 : 16) , the latter being described as lying along the Jabbok (Numbers 21 : 24 ; Deuteronomy 2 : 37 , 3 : 16 ; Joshua 12 : 2) . The territory of Sihon is described as extending " from Arnon unto Jabbok " (Numbers 21 : 24) , and it was reclaimed later by the King of Ammon (Judges 11 : 13 , 22) . Eusebius places the river between Gerasa and Philadelphia .

= = Course = =

The headwaters of the Zarqa begin just northeast of Amman , rising from a spring named Ain Ghazal (" Gazelle spring ") . The river flows to the north before heading west . Rising on the eastern side of the mountains of Gilead , it runs a course of about 105 kilometers (65 mi) in a wild and deep ravine before flowing into the Jordan River between Gennesaret and the Dead Sea , at a point 1 @, @ 090 meters (3 @, @ 576 ft) below its origin . At its higher reaches , the river banks are mostly steep and canyon @-@ like . Near Ain Ghazal , two tributary wadis join the river , and it opens up into a shallow basin . It forms the border between the Jordanian administrative regions of Irbid and Balqa Governorate .

The river is perennial , but with a very low base flow of about 2 ? million to 3 million cubic meters per month during the summer months , and as much as 5 ? million to 8 million cubic meters per month during the rainy winter months . This makes it the second largest tributary of the lower Jordan River , after the Yarmouk River , and the third largest river in the region by annual discharge . Irregular floods after rain storms may increase the flow to as much as 54 million cubic meters . The median annual flow is 63 @. @ 3 million cubic meters . The total basin area is 3 @, @ 900 km2 (1

@, @ 500 sq mi) the largest in Jordan . A small dam , Al @-@ Rwyha dam , near the village of Dayr Alla , marks the end of the upstream portion of the river , where it is natural and fast flowing with very clear water . There is very little agriculture along the banks of the river in this region , which are very rocky . Downstream from this dam , the water level is very low , and the river banks are intensively used for agriculture , as well as grazing by sheep and goats

The King Talal Dam was built across the lower Zarqa in 1970 , and created a reservoir with a capacity of 55 million cubic meters , and increased in 1987 to 86 million cubic meters . When built , it was expected that the reservoir would supply water for municipal use in the Amman region . However , the current levels of pollution in the lake make the water unfit for human consumption , and it is used for irrigation only .

= = = Bridges = = =

The new Jerash Bridge crosses the Zarqa upstream of King Talal reservoir , on the road from Amman to Jerash . The bridge is the site of a gauging station where flow measurements are continuously taken .

In the city of Zarqa , several bridges , vehicular and pedestrian , cross the river . The earliest of these was built by the Chechen founders of the city . Current bridges include the Zawahreh Bridge , a vehicular bridge connecting Baha ' al @-@ Din Street with al @-@ Zuhur Street and another connecting Baha ' al @-@ Din Street with King Talal Street . Two pedestrian bridges connect al @-@ Zuhur Street and Baha ' al @-@ Din Street , and Wasfi al @-@ Tal Street and Petra Street .

= = Natural history = =

The geological origins of the Zarqa river are about 30 million years old , when the Jordan Rift Valley was formed . A ripple effect of its formation was the creation of side @-@ wadis . The Zarqa river carved into the western edge of one of these side wadis . The earliest exposed formations in the area date from the Triassic and early Jurassic periods , and have been named Zerqa and Kurnub formations . The rock formations are marine sediments , remnants of the prehistoric Tethys Sea , which used to cover the area running roughly east - west , halfway across the present Dead Sea . Along the Zarqa , we find crystalline limestone alternating with shale . The next layer is a 20 @-@ 30 meter high layer of gypsum , argillaceous marly lime , shales and iron @-@ rich stone and sandstone . This layer is rich in fossils . The Zarqa valley was an important passageway connecting the Eastern Desert with the Jordan Valley .

= = = Flora = = =

Archaeological finds of charcoaled remains indicate that poplar and tamarix used to grow along the banks of the Zarqa , with forests of wild oak growing on the hillsides . Today , tamarix thickets are still widespread in the floodplains , and the banks are cultivated with fruit orchards and vegetable fields . Along the course of Zarqa river , water is pumped directly and used to irrigate crops of leafy vegetables such as parsley , spinach , cabbage , cauliflower and lettuce , as well as potatoes . Olive trees are also found along the river 's banks . Tulips grow on many hillsides of the river , while in the springs area and the watercourse , water vegetation is found . Natural pine forests grow in the King Talal Dam area . Along the upstream banks , where the river runs wild , one finds the common reed , oleander and Typha species . Since the waters of the Zarqa are highly contaminated , with high levels of organic matter and various chemical compounds (especially detergents and dyes) , the use of Zarqa water for irrigation has significantly altered the biodiversity of the natural flora , and caused the disappearance of the majority of fresh water species .

= = = Fauna = = =

In prehistoric times , the area was rich with fauna , and 45 distinct animal species have been

identified , half of them wild animals . Domesticated goats were the most common , and gazelles were the most frequently occurring wild animal species .

Today , the area is still home to a diverse population of birds and mammals , and some of the breeding species found do not breed anywhere else in Jordan . Among the bird species found are the European roller , desert lark , Dead Sea sparrow , desert finch and blue @-@ cheeked bee @-@ eater . The King Talal dam has created a lake which is a habitat for migratory waterfowl and various fish species . Notable birds found in the lake area include the little bittern , cattle egrets , grey herons , white storks , common teal and Eurasian coot . The lake 's waters sustain fish , some of which are indigenous species and some are introduced species . The most common are tilapia . Migratory birds also winter in the man @-@ made pools which make up the Kherbit Al @-@ Samra Sewage Treatment Plant , located in a broad depression close to Wadi Dhulayl , the main tributary of the Zarqa River . As many as 6 @,@ 000 white storks have been spotted roosting there . Mammals found in the area include the common otter (*Lutra lutra*) , and the Persian squirrel (*Sciurus anomalus*) . The otter is considered a threatened species .

= = History = =

'Ain Ghazal , the origin of the spring the feeds the Zarqa river , is a major archaeological site , dating back to the Neolithic period . It was continuously occupied for more than two thousand years , and the earliest finds date to 7200 BCE . ' Ain Ghazal is one of the earliest known human settlements with evidence of domesticated animals . With a population of around 3 @,@ 000 at its height , it was also one of the largest prehistoric population centers in the Near East , with about five times the population of neighboring Jericho .

During a 1982 survey of the Zarqa valley , a number Early Iron Age sites were discovered , concentrated along the banks of the Zarqa and its tributaries . One of them , Tulul adh @-@ Dhahab , is under further research now .

Wadi Jarash , a northern tributary of the Zarqa River , flows through the modern city of Jerash . Inhabited since the Bronze Age , Jerash was an important Greco @-@ Roman city known as Gerasa , home to noted mathematician Nicomachus . The ruins of the city are well preserved and have been extensively excavated .

Zarqa , Jordan 's second largest city , is built on the banks of the Zarqa River , and is the largest settlement along its course . Today , most of the land and plantations on the riverbanks are owned by the heirs of the patrician El @-@ Wir clan , the rest is owned by the Bani @-@ Hassan tribe , and other local tribes . The town of Zarqa was founded in 1902 by Chechen immigrants . Its population grew rapidly with an influx of Palestinian refugees who fled the West Bank during the Six @-@ Day War .

= = Environmental concerns = =

The Zarqa river is highly polluted . In many areas , raw sewage flows untreated directly into the river through dry riverbeds (wadis) , contaminating it and creating a stench which has been a cause of numerous complaints , particularly during the summer months . Though sewage treatment stations have been built in a couple of locations (including Ain Ghazal and Khirbet As Samara) , these stations often receive more water than they can handle . Such overflow occurs during winter floods , as well as during summer months when the population increases with the return of migrant workers to Amman . During overflow , untreated water runs directly to the Zarqa river . As a result , the Zarqa 's water is brownish colored , often with dense foam due to large amounts of organic matter . Other sources of pollutants are the illegal dumping of industrial waste , including those from textile factories , and batteries and oils from garages .

The river 's watershed encompasses the most densely populated areas east of the Jordan River , and it flows through an industrialized area that is home to more than 52 % of Jordan 's industrial plants , including the Jordan Petroleum Refinery Company . During the summer months , treated domestic and industrial waste @-@ water compose nearly all of the flow , and substantially degrade

the water quality . Coupled with over 40% extraction of water from the underground aquifer and the naturally low base flow of the Zarqa , this has created a major problem , described as one of Jordan 's " environmental black spots " . and has made rehabilitation of the Zarqa a top priority for the Jordanian Ministry of the Environment . The restoration project is estimated to cost \$ 30 million .