A-SAMPLING SITES

1- Qadisha Cave (1720 m)

2011 cave monitoring campaign

Date	Type of sample	Description	T (°C)	PH	Cond. (µSm)	Type of analysis
27/09/2011	River water K11	Water from river taken near the dam	7.2	7.7	180	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)
27/09/2011	River water K12	Water from river taken near the dam	7.2	7.7	180	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)

Date	Type of sample	Description	Type of analysis
27/09/2011	Water sample K2	Fast drip from one Stalagmite	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)
27/09/2011	Water sample K3	Stagnant water in the middle of the gallery	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)
27/09/2011	Water sample K4	Dripwater above the sampled stalagmite	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)
27/09/2011	Water sample K5	Drip water from one stalactite near K2 sampling site	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)
27/09/2011	Water sample K9	fast flow from one stalactite	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)

2014 cave monitoring campaign

Date	29 august 2017	4 october 2017	4 November 2017
Outside temp.	31° at 1:15 pm	16° at 1:35 pm	7.5° at 11 am
location 1	drip water	drip water	drip water
Sampling time	11:53 am	10:55 am	12 pm
Water source	Stagnant pool from drip	Stagnant pool from drip	Stagnant pool from drip
Water temp.	8°	8°	7.5°
Air temp.	8°	8°	8.5°
Type of analysis	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)
location 2	drip water from stalactite	drip water from stalactite	drip water from stalactite
Sampling time	12:14 pm	12:32 pm	11:42 am
Water source	Constant drip	Constant drip	Constant drip
Water temp.	8°		8°
Air temp.	8.5°	7.8°	8.8°
Type of analysis	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)
location 3	River water	River water	River water
Sampling time	12:20 pm	12:40 pm	11:45 am
Water source	River	River	River
Water temp.	7°	6.8°	7°
Air temp.	8.5°	7.8°	8.8°
Type of analysis	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)

2- Jeita cave (96 m asl)

2011 cave monitoring campaign (27/09/2011)

Date	Type of sample	Description	T (°C)	PH	Cond. (µSm)	Type of analysis
27/09/2011	River water J13	Water from river taken at the spring	16.2	8.2	400	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)

27/09/2011	River water J14	Water from river taken at the spring	16.2	8.2	400	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)
27/09/2011	River water J15	Water from river taken at the spring	16.2	8.2	400	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)

Date	Type of sample	Description	Type of analysis
27/09/2011	Water sample J3	Drip water taken near the studied stalagmite (Verheyden et al., 2008)	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)
27/09/2011	Water sample J4	Gours water de gour near the studied stalagmite (Verheyden et al., 2008)	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)
27/09/2011	Water sample J7	Drip water taken above stalagmite JEG-stm2, several soda straw	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)
27/09/2011	Water sample J12	Drip water from single site with a heigh ceiling (25m), near the entrance tunnel.	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)
27/09/2011	Water sample J20	Drip water taken from the guide at the end of the touristic circuit.	Stable isotope ($\delta^{18}O$; $\delta^{2}H$)

2014 cave monitoring campaign

Date	27/08/2014	01/10/2014	19/11/2014
Outside temp.	30° at 2pm.	24.5° at 4pm.	24° at 3:30 pm
Sample 1	Source: Stalactite – Pilliers gallery		
Time	11:10am.	6:45pm.	4:15pm.
Water	Drip water	Drip water	Drip water
Drops / 30Sec.	18	13	
Drops / 1min.	34	25	
Air Temp.	21°	20°	19.2
Type of analysis	Stable isotope ($\delta^{18}O$; δD)	Stable isotope ($\delta^{18}O$; δD)	Stable isotope ($\delta^{18}O$; δD)
Sample 2	Source: Stalactite – Big Gours chamber		
Time	12:30pm.	4:42pm.	5pm
Water	Drip water	Drip water	Drip water
Drops / 30Sec.	37	29	No data
Drops / 1min.	72	58	No Data
Air Temp.	20.5°	19.8°	19.2
Type of analysis	Stable isotope ($\delta^{18}O$; δD)	Stable isotope ($\delta^{18}O$; δD)	Stable isotope ($\delta^{18}O$; δD)
Sample 3	Source: River water - Lower cave		
Time	1:10pm.	4:16pm.	5:45pm
Water	River	River	River
Water temp.	15°	15°	15°
Air Temp.	16.5°	15.5°	15.5°
Type of analysis	Stable isotope ($\delta^{18}O$; δD)	Stable isotope ($\delta^{18}O$; δD)	Stable isotope ($\delta^{18}O$; δD)

3- Kanaan Cave (98 m asl)

2014 cave monitoring campaign

Date	Type of sample	Description	Type of analysis
28/08/14	Kanaan2	water from pool	Stable isotopes ($\delta^{18}O$; $\delta^{2}H$)
28/08/14	Kanaan1	water drip from ceiling	Stable isotopes ($\delta^{18}O$; $\delta^{2}H$)

30/09/14	Kanaan2	water from pool	Stable isotopes ($\delta^{18}O$; $\delta^{2}H$)
30/09/14	Kanaan1	water drip from ceiling	Stable isotopes ($\delta^{18}O$; $\delta^{2}H$)
05/11/14	Kanaan2	water drip from ceiling	Stable isotopes ($\delta^{18}O$; $\delta^{2}H$)
05/11/14	Kanaan1	water from pool	Stable isotopes ($\delta^{18}O$; $\delta^{2}H$)

Date	28/08/2014	30/09/2014	05/11/2014
Outside temp.	31° at 8:50pm.	23.6° at 6:25pm.	16° at 7:15pm.
Location 1	Source: Stalactite - Between Salle Couloir & Salle Ornée		
Time	9:25pm.	6:45pm.	6:48pm.
Water	Constant drip	Drip water	Drip water
Drops / 30Sec.	7	62	80
Drops / 1min.	13	125	164
Air Temp.	20	18.9	20.5
Location 2	Source: Lake - Calcite floor next to Sample 1		
Time	9:35pm.	6:55pm.	6:53pm.
Water	Stagnant	Stagnant	Stagnant
Water temp.	18.5°	18.7°	18.5°
Air Temp.	20°	18.9°	20.5°

4. Mabaage cave (770 m asl)

2014 cave monitoring campaign

Date	Type of sample	Description	Type of analysis
11/18/14	# 1	Stalactite drip	Stable isotopes (δ18O; δD)
11/18/14	# 2	Siphon	Stable isotopes (δ18O; δD)
11/18/14	# 3	Stalactite drip	Stable isotopes (δ18O; δD)
11/18/14	# 4	Siphon	Stable isotopes (δ18O; δD)
10/6/14	# 1	Stalactite drip	Stable isotopes (δ18O; δD)
10/6/14	# 2	Siphon	Stable isotopes (δ18O; δD)
10/6/14	# 3	Stalactite drip	Stable isotopes (δ18O; δD)
8/28/14	# 1	Stalactite drip	Stable isotopes (δ18O; δD)
8/28/14	# 2	pool water	Stable isotopes (δ18O; δD)
8/28/14	# 3	pool water	Stable isotopes (δ18O; δD)

Date	**28/08/14**	**06/09/14**	**04/11/14**
Outside temp.	30° at 12:30pm.	21.1° at 10:17am.	
Sample 1	Source: Stalactite - Entrance area		
Time	11:50am.	11:13am.	12pm
Water	Drip water	Drip water	
Drops / 30Sec.	55	21	
Drops / 1min.	111	41	
Air Temp.	16.5°	16.5°	

Sample 2	Source: small lake on sand - Entrance area		
Time	12pm.	10:30 am	
Water	Stagnant	Lake empty	
Air Temp.	16.5°	16.5°	

Sample 2'	Source: Siphon		
Time	--	10:38am	
Water	--	Stagnant	
Water temp.	--	13°	
Air Temp.	--	13.5°	

Sample 3'	Source: Stalactie near Siphon area		
Time		11:02am.	
Water		Drip water	
Drops / 30Sec.		15	
Drops / 1min.		29	
Air Temp.		13.5°	

B-RESULTS

1- Qadisha Cave (1720 asl)

Sample	**Description**	**Code**	**$\delta^{18}O$**	**StD (2σ)**	**δD**	**StD. (1 v)**
K2 9-2011	Fast drip from one Stalagmite	__	__	__	__	__
K3 9-2011	Stagnant water- middle of the gallery	**C**	-8.46	0.05	-46.4	0.7
K4 9-2011	Dripwater above the sampled stalagmite	**1111**	-8.49	0.05	-46.3	0.7
K5 9-2011	Dripwater from 1 stalactite near K2 site	**1113**	-8.47	0.05	-46.7	0.7
K9 9-2011	Very fast flow from 1 stalactite	**1114**	-8.43	0.05	-46.0	0.7
K11 9-2011	Water from the river taken near the dam	**1115**	-8.95	0.05	-49.5	0.7
K12 9-2011	Water from the river taken near the dam	**1116**	-8.95	0.05	-49.4	0.7

Sample	**Description**	**Code**	**$\delta^{18}O$**	**StD. (2σ)**	**δD**	**StD (2σ)**	**D excess**
Qad.1 (8-2014)	Pool	CW30	-8.49	0.06	-45.87	0.13	22.1
Qad.2 (8-2014)	drip water (stal)	CW5	-8.38	0.06	-45.67	0.13	21.4
Qad.1 (10-2014)	Pool	CW9	-8.48	0.06	-45.81	0.13	22.0
Qad.2 (10-2014)	drip water (stal)	CW18	-8.54	0.06	-45.95	0.13	22.4
Qad.3 (10-2014)	River	CW23	-8.96	0.06	-49.09	0.13	22.6
Qad.1 (11-2014)	Pool	CW17	-8.55	0.06	-46.11	0.13	22.3
Qad.2 (11-2014)	drip water (stal)	CW15	-8.54	0.06	-45.95	0.13	22.4
Qad.3 (11-2014)	River	CW35	-8.92	0.06	-48.90	0.13	22.4

2- Jeita cave (96 m asl)

Sample	**Description**	**Code**	**$\delta^{18}O$**	**StD (2σ)**	**δD**	**StD (1σ)**
J3	Drip water taken near the studied stalagmite (Verheyden et al., 2008)	1117	-5.18	0.05	-23.8	0.7
J4	Gours water de gour near the studied stalagmite (Verheyden et al., 2008)	1120	-4.05	0.05	-14.2	0.7
J12	Drip water from single site with a heigh ceiling (25m), near the entrance tunnel.	1119	-4.05	0.05	-13.8	0.7
J13	Water from river taken at the spring	1118	-5.42	0.05	-25.8	0.7
J14	Water from river taken at the spring	1123	-7.30	0.05	-36.3	0.7

J15	Water from river taken at the spring	1121	-7.30	0.05	-35.9	0.7
J20	Drip water taken from the guide at the end of the touristic circuit.	1122	-7.25	0.05	-36.0	0.7

Sample	Description	Code	$\delta^{18}O$	StD. (2σ)	δD	StD. (2σ)	D excess
Jeita1 (8-2014)	water drip (stal)	CW32	-6.41	0.06	-29.48	0.13	21.8
Jeita3 (8-2014)	River	CW36	-7.35	0.06	-35.85	0.13	23.0
Jeita2 (8-2014)	water drip (stal)	CW37	-6.91	0.06	-33.99	0.13	21.3
Jeita2 (10-2014)	water drip (stal)	CW11	-6.83	0.06	-33.76	0.13	20.9
Jeita1 (10-2014)	water drip (stal)	CW24	-6.40	0.06	-29.61	0.13	21.6
Jeita3 (10-2014)	River	CW29	-7.28	0.06	-35.36	0.13	22.9
Jeita3 (11-2014)	River	CW8	-7.17	0.06	-34.87	0.13	22.5
Jeita2 (11-2014)	water drip (stal)	CW20	-6.92	0.06	-34.28	0.13	21.1
Jeita1 (11-2014)	water drip (stal)	CW28	-6.39	0.06	-29.36	0.13	21.8

3- Kanaan Cave (98 m asl)

Sample	Description	Code	$\delta^{18}O$	StD (2σ)	δD	StD (2σ)	D excess
Kanaan2 (8-2014)	Water Pool	CW31	-5.37	-23.76	19.2	0.06	0.13
Kanaan2 (10-2014)	Water Pool	CW12	-5.37	-23.76	19.2	0.06	0.13
Kanaan2 (11-2014)	Water Pool	CW21	-5.40	-23.82	19.4	0.06	0.13
Kanaan1 (8-2014)	water drip	CW22	-5.43	-24.12	19.3	0.06	0.13
Kanaan1 (10-2014)	water drip	CW16	-5.47	-24.22	19.5	0.06	0.13
Kanaan1 (11-2014)	water drip	CW19	-5.46	-24.14	19.5	0.06	0.13

4- Mabaage Cave (770 m asl)

Sample	Description	Code	$\delta^{18}O$	StD (2σ)	$\delta^{2}H$	St.dev (2σ)	D excess
Mabaage1 (8-2014)	drip water (stal)	CW13	-8.28	-44.33	21.9	0.06	0.13
Mabaage2 (8-2014)	Pool	CW33	-8.27	-44.08	22.1	0.06	0.13
Mabaage3 (8-2014)	Pool	CW34	-8.35	-44.47	22.3	0.06	0.13
Mabaage2 (10-2014)	Sump	CW25	-6.60	-30.94	21.8	0.06	0.13
Mabaage3 (10-2014)	drip water (stal)	CW26	-6.67	-31.27	22.1	0.06	0.13
Mabaage2 (11-2014)	Sump	CW10	-6.58	-30.48	22.1	0.06	0.13
Mabaage 3 (11-2014)	drip water (stal)	CW14	-6.64	-30.76	22.4	0.06	0.13
Mabaage1 (11-2014)	drip water (stal)	CW27	-7.14	-36.55	20.6	0.06	0.13