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Supplementary Information for

Reconstructing orogens without biostratigraphy: The Saharides and continental growth during the final assembly of Gondwana-Land

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Figure S1. A tectonic map of the Saharides based on the identification of their tectonic environments. The Saharides are compiled from refs. 1-16 for Egypt, ref.17 for Saudi Arabia, ref.18 for Yemen, ref.19 for Sudan, ref. 20 for Ethiopia and Eretria, ref.21 for Tibesti ref. 22 for the rest. The Pre-Saharide units are generalised from ref.22, ref.18, and the refs. 23-25. All graphical features are plotted using the WGS 84 / Antarctic Polar Stereographic Projection (EPSG: 3031). The map was made on a reconstructed north Africa/Arabia ensemble using the data reported in Tables S1 and S2. GPlates freeware[26] was used for the reconstruction. 445 Ma reconstruction, as proxy to the Ediacaran reconstruction, is adapted from ref. 27.

Table S1. List of the isotopic age data

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
1	9.2500	14.0000	fm	Niger	Trans-Saharan	Damagaram	Birnin Kazoe heterogeneous	granite	Rb-Sr	580 ± 69	WR	isochrone	emplacement	SYN-OROGENIC		28
2	9.5933	14.1447	fm	Niger	Trans-Saharan	Damagaram	Moha	fine-granied biotite monzogranite	Rb-Sr	530 ± 44	WR	isochrone	emplacement	SYN-OROGENIC		28
3	9.0908	13.8769	fm	Niger	Trans-Saharan	Damagaram	Tyanza	granite	Rb-Sr	556 ± 63	WR	isochrone	emplacement	SYN-OROGENIC		28
4	9.1019	14.0067	fm	Niger	Trans-Saharan	Damagaram	Dakousa	biotite muscovite syenogranite	Rb-Sr	579 ± 14	WR	isochrone	emplacement	SYN-OROGENIC		28
5	35.2000	23.7500		Egypt	Eastern Desert	Wadi Shût	Tonalite pluton	quartz diorite	U-Pb	711 ± 7	zircon	concordia	emplacement	SYN-OROGENIC		29
6	32.2640	25.9440	fm	Egypt	Eastern Desert	Wadi Shût	Precambrian Shield	tonalite to granodiorite	Rb-Sr?	612	?	?	emplacement	ARC	29	30
7	33.3060	25.5790	fm	Egypt	Eastern Desert	Wadi Shût	Precambrian Shield	tonalite to granodiorite	Rb-Sr?	671	?	?	emplacement	ARC	29	30
8	33.7630	22.7560	fm	Egypt	Eastern Desert	Wadi Shût	Precambrian Shield	tonalite to granodiorite	Rb-Sr?	761	?	?	emplacement	ARC	29	30
9	22.0833	26.6667		Egypt	East Saharan Craton	Uweinat	Gebel Kamil migmatite	leucocratic migmatite	Rb-Sr	673 ± 56	WR	concordia	emplacement	?		31
10	29.3330	22.9100		Egypt	East Saharan Craton	Bir Safsaf	Pre Pan-African basement	granite - microdiorite	Rb-Sr	578 ± 9	WR	isochrone	emplacement	POST-OROGENIC		31
11	30.0000	19.8330		Sudan	East Saharan Craton	Nubian Desert microgranite	Pre Pan-African basement	microgranite	Rb-Sr	623 ± 37	WR	isochrone	emplacement	POST-OROGENIC		31
12	30.3330	19.8330		Sudan	East Saharan Craton	Nubian Desert red granite	Pre Pan-African basement	granite	Rb-Sr	565 ± 8	WR	isochrone	emplacement	POST-OROGENIC		31
13	29.5830	17.8330		Sudan	East Saharan Craton	Wadi Howar East granite	Pre Pan-African basement	granite	Rb-Sr	562 ± 7	WR	isochrone	emplacement	POST-OROGENIC		31
14	29.1660	17.7500		Sudan	East Saharan Craton	Wadi Howar microgranites	Pre Pan-African basement	microgranite	Rb-Sr	585 ± 19	WR	isochrone	emplacement	POST-OROGENIC		31
15	30.8160	20.4500		Sudan	Arabian-Nubian Shield	Delgo Sture Zone	El Hamri ophiolite	cumulate metagabbro	Sm-Nd	752 ± 48	WR	isochrone	formation	OCEANIC		32
16	27.3680	18.0210	cop	Sudan	Arabian-Nubian Shield	Zalingei Zone	Jebel Rahib ophiolite	isotropic gabbro	Sm-Nd	707 ± 54	WR	isochrone	formation	ARC		32
17	30.5000	25.0830		Egypt	Arabian-Nubian Shield	Delgo Sture Zone	Gneiss Basement	tonalite	Pb-Pb	718 ±11	zircon	evaporation	formation	ARC		32

NO	LON	LAT	ORG.*	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
18	30.2660	20.3160		Sudan	Arabian-Nubian Shield	Delgo Sture Zone	Eastern high-grade basement	deformed tonalite	Pb-Pb	749 ± 12	zircon	evaporation	formation	ARC		32
19	30.8160	20.5000		Sudan	Arabian-Nubian Shield	Delgo Sture Zone	El Hamri complex	granodiorite	Pb-Pb	661 ± 12	zircon	evaporation	formation	ARC		32
20	30.7830	20.4000		Sudan	Arabian-Nubian Shield	Delgo Sture Zone	El Hamri complex	tonalite	Pb-Pb	680 ± 12	zircon	evaporation	formation	ARC		32
21	30.2660	20.3160		Sudan	Arabian-Nubian Shield	Delgo Sture Zone	Sulb unit	calc-silicate rocks	Sm-Nd	702 ± 27	Gr-WR	isochrone	peak metamorphism	METAMORPHISM		32
22	31.0830	20.0100		Sudan	Arabian-Nubian Shield	Delgo Sture Zone	Eastern high-grade basement	garnet-biotite gneiss	Sm-Nd	592 ± 16	Gr-WR	isochrone	metamorphism	METAMORPHISM		32
23	30.1160	20.0660		Sudan	Arabian-Nubian Shield	Delgo Sture Zone	Eastern high-grade basement	high grade acidic gneiss	Rb-Sr	546 ± 19	WR	isochrone	metamorphism	METAMORPHISM		32
24	27.0680	17.8090	cop	Sudan	Arabian-Nubian Shield	Jebel Rahib	Eastern Jebel Rahib Belt	metagabbro	K-Ar	860 ± 17	hornblende		formation	OCEANIC		33
25	27.0680	17.8090	cop	Sudan	Arabian-Nubian Shield	Jebel Rahib	Eastern Jebel Rahib Belt	metabasalt-pillow	K-Ar	775 ± 16	WR		formation	OCEANIC		33
26	27.0680	17.8090	cop	Sudan	Arabian-Nubian Shield	Jebel Rahib	Eastern Jebel Rahib Belt	metabasalt-pillow	K-Ar	740 ± 15	WR		formation	OCEANIC		33
27	27.0680	17.8090	cop	Sudan	Arabian-Nubian Shield	Jebel Rahib	WesternJebel Rahib Belt	granitic metasediment	K-Ar	555 ± 24	biotite		contact metamorphism	LATE/POST-OROGENIC		33
28	42.2050	19.9940		Saudi Arabia	Arabian-Nubian Shield	Wadi Ta'al Shear Zone	Central Tabalah area	hornblende schist	Ar-Ar	765 ± 5	hornblende	stepvise heating	dextral strike-slip	FAULTING		34
29	42.2450	20.0200		Saudi Arabia	Arabian-Nubian Shield	Wadi Ta'al Shear Zone	Central Tabalah area	hornblende schist	Ar-Ar	764 ± 7	hornblende	stepvise heating	dextral strike-slip	FAULTING		34
30	42.3630	19.7210		Saudi Arabia	Arabian-Nubian Shield	Tabalah Ta'al Shear Zone	Wadi Tarj area	hornblende schist	Ar-Ar	779 ± 7	hornblende	stepvise heating	WSW directed thrusting	FAULTING		34
31	42.3160	19.6830		Saudi Arabia	Arabian-Nubian Shield	Tabalah Ta'al Shear Zone	Wadi Tarj area	non-deformed granodiorite	Ar-Ar	761 ± 6	hornblende	isochrone	emplacement	ARC		34
32	43.8150	20.0810		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Murdama Group	rhyolite	Rb-Sr	568± 29	WR	isochrone	formation	POST-OROGENIC		35
33	42.8500	20.1360		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Junaynah quadrangle	meta-andesite	Rb-Sr	785± 96	WR	isochrone	formation	ARC		35
34	43.7510	17.6800		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Wadi Shuklalah	metavolcanic	Rb-Sr	593± 53	WR	isochrone	formation	POST-OROGENIC		35
35	42.1500	19.2500		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Wadi bin Dwaynah	metavolcanic	Rb-Sr	912± 76	WR	isochrone	formation	ARC		35
36	42.9660	19.1330		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Khadrah Formation	metavolcanic	Rb-Sr	746± 16	WR	isochrone	formation	ARC		35
37	42.6200	20.6400		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Hishat al Hawi	metavolcanic	Rb-Sr	660± 43	WR	isochrone	formation	ARC	35	36

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
38	43.8930	21.0660		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Arphan Formation	rhyolite	Rb-Sr	761± 23	WR	isochrone	intrusion	ARC	35	36
39	43.7250	21.4200		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Juqjuq Formation	pyroxene andesite	Rb-Sr	620± 95	WR	isochrone	intrusion	LATE-OROGENIC		35
40	41.6160	19.9160		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Biljurshi	quartz diorite	Rb-Sr	890± 67	WR	isochrone	intrusion	ARC		35
41	41.5810	19.9060		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Biljurshi	quartz diorite	Rb-Sr	848±282	WR	isochrone	intrusion	ARC		35
42	40.1420	20.5150		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Wadi Khadrah	quartz diorite	Rb-Sr	895±173	WR	isochrone	intrusion	ARC		35
43	40.9260	20.3430		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Wadi ash	quartz diorite	Rb-Sr	853± 72	WR	isochrone	intrusion	ARC		35
44	42.2000	19.0500		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	An Nimas	quartz diorite	Rb-Sr	837± 50	WR	isochrone	intrusion	ARC		35
45	42.2480	19.7330		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Wadi Tarj	quartz diorite	Rb-Sr	818± 95	WR	isochrone	intrusion	ARC		35
46	41.9750	19.6000		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Al Mushirah	quartz diorite	Rb-Sr	747±178	WR	isochrone	intrusion	ARC		35
47	42.9050	20.0600		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Jabal Umm al Hashiyah	quartz diorite	Rb-Sr	723±107	WR	isochrone	intrusion	ARC		35
48	43.1410	20.1480		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Al Qarah quadrangle	quartz diorite	Rb-Sr	724± 93	WR	isochrone	intrusion	ARC		35
49	43.9900	21.2750		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Jabal Yafikh	hornblende diorite	Rb-Sr	522±429	WR	isochrone	intrusion	POST-OROGENIC	35	36
50	44.0000	18.3660		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Wadi Makhdhul	quartz diorite	Rb-Sr	843 ±273	WR	isochrone	intrusion	ARC		35
51	44.0660	18.3830		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Wadi Malahah	granodiorite	Rb-Sr	684± 43	WR	isochrone	intrusion	ARC		35
52	42.2170	19.0160		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Jabal Mina	granodiorite gneiss	Rb-Sr	746±114	WR	isochrone	intrusion	ARC		35
53	42.6680	18.4450		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Wadi Bishah	granitic gneiss	Rb-Sr	664± 9	WR	isochrone	intrusion	ARC		35
54	42.0330	18.7330		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Wadi Bagarah	granodiorite gneiss	Rb-Sr	763± 53	WR	isochrone	intrusion	ARC		35
55	39.2670	21.5210		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Jiddah Airport	granitic gneiss	Rb-Sr	763±159	WR	isochrone	intrusion	ARC		35
56	42.8680	18.3417		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Tindahah batholith	granodiorite	Rb-Sr	626± 17	WR	isochrone	intrusion	ARC	35	37
57	41.8750	19.8000		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Wadi Shuwas	quartz monzonite	Rb-Sr	636± 21	WR	isochrone	intrusion	ARC		35
58	42.1183	18.8030		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Jabal Qal	quartz monzonite	Rb-Sr	620± 18	WR	isochrone	intrusion	LATE-OROGENIC		35

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
59	43.8183	17.6030		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Wadi Halal	granodiorite	Rb-Sr	643 ± 20	WR	isochrone	intrusion	ARC		35
60	42.7150	20.6780		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Wadi al Miyah	granodiorite	Rb-Sr	587± 99	WR	isochrone	intrusion	LATE-OROGENIC		35
61	42.9533	20.2780		Saudi Arabia	Arabian-Nubian Shield	Arabian Shield	Wadi Musayrah	granodiorite	Rb-Sr	623± 18	WR	isochrone	intrusion	ARC		35
62	41.9013	20.2240		Saudi Arabia	southern Arabian shield	Asir terrane	Ablah group	rhyolite	U-Pb	613±7	zircon	SHRIMP-RG	formation	ARC		38
63	41.8542	20.1528		Saudi Arabia	southern Arabian shield	Asir terrane	Ablah group	rhyolite	Pb-Pb	641 ±1	zircon	evaporation	formation	ARC		39
64	42.1903	20.1690		Saudi Arabia	southern Arabian shield	Asir terrane	Al Khalij pluton	granitoid	U-Pb	755±7	zircon	SHRIMP-RG	intrusion	ARC		38
65	42.7003	19.3990		Saudi Arabia	southern Arabian shield	Asir terrane	Hadabah pluton	granitoid	U-Pb	606±2	zircon	SHRIMP-RG	intrusion	LATE-OROGENIC		38
66	42.8019	20.0720		Saudi Arabia	southern Arabian shield	Asir terrane	Nunaynah	granite	U-Pb	646± 10	zircon	SHRIMP-RG	intrusion	LATE-OROGENIC		38
67	42.9310	20.1825		Saudi Arabia	southern Arabian shield	Asir terrane	Musayrah pluton	granitoid	U-Pb	654±3	zircon	SHRIMP-RG	intrusion	LATE-OROGENIC		38
68	43.1658	20.2736		Saudi Arabia	southern Arabian shield	Asir terrane	Abss	granodiorite	U-Pb	651±4	zircon	SHRIMP-RG	intrusion	LATE-OROGENIC		38
69	43.4477	20.1160		Saudi Arabia	southern Arabian shield	Asir terrane	Ash Shawhatah pluton	granitoid	U-Pb	640±3	zircon	SHRIMP-RG	intrusion	LATE-OROGENIC		38
70	43.6088	19.5271		Saudi Arabia	southern Arabian shield	Asir terrane	Tathlith gneiss	gneiss	U-Pb	652±2	zircon	SHRIMP-RG	intrusion	LATE-OROGENIC		38
71	32.9370	18.1550	cop	Sudan	Mozambique Orogenic Belt	East Saharan Craton	Bayuda Desert basement	metavolcanic (amphibolite)	Sm-Nd	806 ± 19	WR	isochrone	intrusion	ARC		40
72	8.8610	19.5590	fm	Niger Republic	Tuareg shield	Air Massif	Emzeggar (Dabaga) calc-alk. granitoids	monzogranite	U-Pb	714 ±19 /-18	zircon	isochrone	intrusion	LATE-OROGENIC		41
73	9.7980	17.5080	fm	Niger Republic	Tuareg shield	Air Massif	Proche-Tenere	alkaline rhyolitic dykes	Rb-Sr	529 ± 11	WR	isochrone	intrusion	INTRA-PLATE		41
74	8.1440	17.3290	fm	Niger Republic	Tuareg shield	Air Massif	Dabaga Forest	monzogranite	U-Pb	643 ±11/ -10	zircon	isochrone	intrusion	LATE-OROGENIC		41
75	8.2410	19.3320	fm	Niger Republic	Tuareg shield	Air Massif	Teggar	monzogranite	Rb-Sr	586 ± 93	WR	isochrone	intrusion	LATE-OROGENIC		41
76	8.5230	18.7220	fm	Niger Republic	Tuareg shield	Air Massif	Iferouane	monzogranite	Rb-Sr	602 ± -14	WR	isochrone	intrusion	LATE-OROGENIC		41
77	8.0140	18.7600	fm	Niger Republic	Tuareg shield	Air Massif	Renatt anatectie	leucocratic granite	Rb-Sr	666 ± 11	WR	isochrone	intrusion	LATE-OROGENIC		41
78	9.2340	17.4380	fm	Niger Republic	Tuareg shield	Air Massif	Takarakoum pluton	granite	Rb-Sr	701 ±26	WR	isochrone	intrusion	POST-OROGENIC	41	42
79	9.0770	17.3910	fm	Niger Republic	Tuareg shield	Air Massif	Beurhot batholith	granite	Rb-Sr	698 ± 21	WR	isochrone	intrusion	POST-OROGENIC	41	42

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
80	9.3580	17.6520	fm	Niger Republic	Tuareg shield	Air Massif	Tchebarlare pluton	granite	U-Pb	664 ± 8	zircon	isochrone	intrusion	POST-OROGENIC		41
81	15.3333	23.5833	cop	Libya	Saharan Craton	Tibesti Massif	Ben Ghnema batholith	granite	Rb-Sr	586± 27	Bt-WR	isochrone	intrusion	ARC		43
82	15.4167	23.3333	cop	Libya	Saharan Craton	Tibesti Massif	Ben Ghnema batholith	granite	Rb-Sr	550± 11	Bt-WR	isochrone	intrusion	ARC		43
83	15.5000	22.7500	cop	Libya	Saharan Craton	Tibesti Massif	Ben Ghnema batholith	pegmatites	Rb-Sr	533± 5	Ms-WR	isochrone	intrusion	ARC		43
84	19.1250	23.1620	cop	Libya	Saharan Craton	Super Tibestian magmatic series	Kangara pluton	alkali granite	Rb-Sr	560±4	WR	isochrone	intrusion	POST-OROGENIC		43
85	17.5170	6.0550	fm	Central African Republic	Congo Craton	the Oubanguides belt	Mpoko granulite	granulite charnockitic affinit	U-Pb	833 ±66	zircon	isochrone	intrusion ? Granulite met.?	METAMORPHISM		44
86	17.2640	6.7740	fm	Central African Republic	Congo Craton	the Oubanguides belt	Lere granulite	granulite charnockitic affinit	U-Pb	652 ±19	zircon	isochrone	intrusion ? Granulite met.?	METAMORPHISM		44
87	19.0390	5.8120	fm	Central African Republic	Congo Craton	the Oubanguides belt	Sibut granulite	granulite charnockitic affinit	U-Pb	639 ±3 Ma	zircon	isochrone	intrusion ? Granulite met.?	METAMORPHISM		44
88	39.5500	21.5500		Saudi Arabia	Arabian Shield	Arabian Shield	Fatima	granite	Rb-Sr	773± 16	WR	isochrone	intrusion	SYN-OROGENIC		45
89	39.5833	21.5167		Saudi Arabia	Arabian Shield	Arabian Shield	Fatima volcanics	andesite to rhyolite	Rb-Sr	675 ±17	WR	isochrone	formation	POST-OROGENIC		45
90	38.8833	23.5500		Saudi Arabia	Arabian Shield	Arabian Shield	Hamra	tonalite	Rb-Sr	641 ±218	WR	isochrone	intrusion	POST-OROGENIC		45
91	38.9333	23.7500		Saudi Arabia	Arabian Shield	Arabian Shield	Hamra	alkali granite	Rb-Sr	686 ±26	WR	isochrone	intrusion	POST-OROGENIC		45
92	38.9167	23.8833		Saudi Arabia	Arabian Shield	Arabian Shield	Badr volcanics	basaltic andesites and rhyolites	Rb-Sr	659 ±38	WR	isochrone	formation	POST-OROGENIC		45
93	41.2500	25.5833		Saudi Arabia	Arabian Shield	Arabian Shield	Nuqrah	granite	Rb-Sr	635± 18	WR	isochrone	intrusion	POST-OROGENIC		45
94	41.2667	25.6333		Saudi Arabia	Arabian Shield	Arabian Shield	Nuqrah volcanics	diabase?	Rb-Sr	625 ±16	WR	isochrone	intrusion	POST-OROGENIC		45
95	35.5833	28.0000		Saudi Arabia	Arabian Shield	Arabian Shield	Midian	peralkaline granite	Rb-Sr	586 ± 11	WR	isochrone	intrusion	POST-OROGENIC		45
96	37.6450	26.3900		Saudi Arabia	Arabian Shield	Northwestern Shield	Jabal Ess	trondhjemite	U-Pb	706± 11	zircon	isochrone	intrusion	ARC		46
97	37.6967	26.3733		Saudi Arabia	Arabian Shield	Northwestern Shield	Jabal Ess	gabbro	U-Pb	780± 11	zircon	isochrone	intrusion	ARC		46

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
98	37.7900	25.0200		Saudi Arabia	Arabian Shield	Northwestern Shield	Jabal al Wask	gabbro	U-Pb	751 ± 11	zircon	isochrone	intrusion	ARC		46
99	38.0300	25.2533		Saudi Arabia	Arabian Shield	Northwestern Shield	Jabal al Wask	plagiogranite	U-Pb	740± 11	zircon	isochrone	intrusion	ARC		46
100	37.7683	24.7717		Saudi Arabia	Arabian Shield	Northwestern Shield	Salajah	tonalite	U-Pb	696 ±5	zircon	isochrone	intrusion	ARC		46
101	39.3967	22.6367		Saudi Arabia	Arabian Shield	West-central Shield	Thurwah	gabbro	U-Pb	870± 11	zircon	isochrone	intrusion	ARC		46
102	40.8817	23.9133		Saudi Arabia	Arabian Shield	West-central Shield	Bir Umq Sture	metadiorite	U-Pb	838± 10	zircon	isochrone	formation	ARC		46
103	40.8050	25.6750		Saudi Arabia	Arabian Shield	Nabitah suture	Tuluhah	plagiogranite	U-Pb	823 ± 11	zircon	isochrone	formation	ARC		46
104	41.9417	23.4267		Saudi Arabia	Arabian Shield	Nabitah suture	Ad Dafinah	quartz diorite	U-Pb	732 ± 27	zircon	isochrone	formation	ARC		46
105	43.5733	19.5817		Saudi Arabia	Arabian Shield	Nabitah suture	Tathlith	gabbro	U-Pb	627± 4	zircon	isochrone	intrusion	ARC		46
106	44.6483	24.3450		Saudi Arabia	Arabian Shield	Eastern Shield	Ar Ridaniyah	metadacite	U-Pb	766 ± 7	zircon	isochrone	formation	ARC		46
107	43.3440	23.5260		Saudi Arabia	Arabian Shield	Eastern Shield	Urd	gabbro	U-Pb	694 ± 8	zircon	isochrone	intrusion	ARC		46
108	37.5360	26.2560	fm	Saudi Arabia	Arabian Shield	Arabian Shield	Midyan arc basement	gabbro	Sm-Nd	782 ± 38	WR	isochrone	intrusion	ARC	46	47
109	37.8930	25.0280	fm	Saudi Arabia	Arabian Shield	Arabian Shield	Midyan arc basement	gabbro	Sm-Nd	743 ± 24	WR	isochrone	intrusion	ARC	46	47
110	38.2560	25.4350	fm	Saudi Arabia	Arabian Shield	Arabian Shield	Midyan arc basement	tonalite	U-Pb	743 ± 10	zircon	ID-TIMS	intrusion	ARC	46	48
111	37.7950	25.4030	fm	Saudi Arabia	Arabian Shield	Arabian Shield	Midyan arc basement	tonalite	U-Pb	720 ± 05	zircon	ID-TIMS	intrusion	ARC	46	48
112	41.2460	25.6470	fm	Saudi Arabia	Arabian Shield	Arabian Shield	Midyan arc basement	Na-rhyolite	U-Pb	839 ± 23	zircon	ID-TIMS	intrusion	ARC	46	48
113	41.4680	23.5770	fm	Saudi Arabia	Arabian Shield	Arabian Shield	Arc basement	tonalite	U-Pb	760 ± 10	zircon	ID-TIMS	intrusion	ARC	46	48
114	41.0390	23.3540	fm	Saudi Arabia	Arabian Shield	Arabian Shield	Arc basement	tonalite	U-Pb	816 ± 03	zircon	ID-TIMS	intrusion	ARC	46	48
115	40.3290	20.4650	fm	Saudi Arabia	Arabian Shield	Arabian Shield	Arc basement	metavolcanics	Rb-Sr	821 ± 19	WR	isochrone	intrusion	ARC	46	49
116	40.7390	20.9400	fm	Saudi Arabia	Arabian Shield	Arabian Shield	Arc basement	metavolcanics	Rb-Sr	847 ± 34	WR	isochrone	intrusion	ARC	46	49
117	41.5780	23.8060	fm	Saudi Arabia	Arabian Shield	Arabian Shield	Deformation zone along suture	granodiorite	U-Pb	815 ± 09	zircon	?	intrusion	SYN-OROGENIC	46	J.S. Stacey, unpublished data as cited

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
118	42.6580	21.2990	fm	Saudi Arabia	Arabian Shield	Arabian Shield	Deformation zone along suture	tonalite gneiss	U-Pb	728 ± 10	zircon	?	intrusion	SYN-OROGENIC	46	J.S. Stacey, unpublished data as cited
119	45.2610	24.0830	fm	Saudi Arabia	Arabian Shield	Arabian Shield	Al Amar Suture	trondhjemite	U-Pb	667 ± 17	zircon	ID-TIMS	intrusion		46	Calvez et al. (in prep., as cited by 46)
120	45.3050	23.2917		Saudi Arabia	Arabian Shield	Arabian Shield	Ar Rayn province	tonalite	U-Pb	650 ± 09	zircon	ID-TIMS	intrusion	ARC		50
121	44.0967	23.6083		Saudi Arabia	Arabian Shield	Afif province	As Sawda domain	bt-hb tonalite	U-Pb	677 ± 9	zircon	ID-TIMS	intrusion			50
122	44.3200	23.5333		Saudi Arabia	Arabian Shield	Ad Dawadimi province	Urd group ophiolite	hypersthene gabbro	U-Pb	694 ± 8	zircon	ID-TIMS	intrusion	OCEANIC		50
123	44.4000	23.8150		Saudi Arabia	Arabian Shield	Ad Dawadimi province	Ar Rukhaman	two mica monzogranite	U-Pb	641 ± 25	zircon	ID-TIMS	intrusion	POST-OROGENIC		50
124	44.6000	23.2550		Saudi Arabia	Arabian Shield	Ad Dawadimi province	Jabal Sabbah	two mica monzogranite	U-Pb	607 ± 19	zircon	ID-TIMS	intrusion	POST-OROGENIC		50
125	44.7150	23.5983		Saudi Arabia	Arabian Shield	Ad Dawadimi province	Jabal Khura	bt monzogranite	U-Pb	598 ± 35	zircon	ID-TIMS	intrusion	POST-OROGENIC		50
126	45.1833	23.8550		Saudi Arabia	Arabian Shield	Ar Rayn province	Al Amar volcanics	biotite-hornblende quartz diorite	U-Pb	633 ± 5	zircon	ID-TIMS	intrusion	ARC		50
127	45.1133	23.6000		Saudi Arabia	Arabian Shield	Ar Rayn province	Al Amar volcanics	hornblende diorite	U-Pb	634± 6	zircon	ID-TIMS	intrusion	ARC		50
128	45.1200	23.8917		Saudi Arabia	Arabian Shield	Ar Rayn province	Jabal al Jabara	biotite leucogranodiorite (meta)	U-Pb	631 ± 7	zircon	ID-TIMS	intrusion	ARC		50
129	44.3550	23.8760		Saudi Arabia	Arabian Shield	Ar Rayn province	Al Amar	hornblende tonalite	U-Pb	623 ± 5	zircon	ID-TIMS	intrusion	ARC		50
130	43.3127	22.1790		Saudi Arabia	Arabian Shield	Zalm quadrangle	Southwest Zalm quadrangle	diorite gneiss	U-Pb	782 ± 4	zircon	ID-TIMS	intrusion	ARC		51
131	42.5498	22.3960		Saudi Arabia	Arabian Shield	Zalm quadrangle	Jidh suite	granodiorite gneiss	U-Pb	696 ± 9	zircon	ID-TIMS	intrusion	ARC		51
132	42.6273	22.0072		Saudi Arabia	Arabian Shield	Zalm quadrangle	Subay suite	granodiorite gneiss	U-Pb	683 ± 9	zircon	ID-TIMS	intrusion	SYN-OROGENIC		51
133	42.6110	22.7238		Saudi Arabia	Arabian Shield	Zalm quadrangle	Jidh suite	diapiric monzogranite	U-Pb	646 ± 17	zircon	ID-TIMS	intrusion	SYN-OROGENIC		51
134	43.0145	22.8240		Saudi Arabia	Arabian Shield	Zalm quadrangle	Haml suite	granodiorite	U-Pb	632 ± 1.5	zircon	ID-TIMS	intrusion	FAULTING		51
135	42.6022	22.7302		Saudi Arabia	Arabian Shield	Zalm quadrangle	Hufayrah complex	granite	U-Pb	632 ± 3	zircon	ID-TIMS	intrusion	FAULTING		51
136	42.7998	22.7987		Saudi Arabia	Arabian Shield	Zalm quadrangle	Bani Ghayy group	rhyolite	U-Pb	620 ± 5	zircon	ID-TIMS	intrusion	FAULTING		51

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
137	42.7140	22.2522		Saudi Arabia	Arabian Shield	Zalm quadrangle	Haml suite	monzogranite	U-Pb	620 ± 18	zircon	ID-TIMS	intrusion	FAULTING		51
138	31.7540	23.1610	cop	Egypt	East Saharan Craton	Nile Craton	Gebel Um Shagir	granite gneiss	U-Pb	626 +4 /-3	zircon	ID-TIMS	intrusion	ARC		52
139	32.7680	23.8890	cop	Egypt	East Saharan Craton	Nile Craton	SW Aswan	granite	U-Pb	741 ± 3	zircon	ID-TIMS	intrusion	ARC		52
140	32.7110	24.1890	cop	Egypt	East Saharan Craton	Nile Craton	Aswan	granite gneiss	U-Pb	626 +4/-3	zircon	ID-TIMS	intrusion	ARC		52
141	32.9010	27.8590	cop	Egypt	Northern Nubian Shield	the Ras Gharib segment	the Ras Gharib segment	diorite-tonalite	Rb-Sr	881 ± 58	WR	isochrone	intrusion	ARC		53
142	32.8540	27.9220	cop	Egypt	Northern Nubian Shield	the Ras Gharib segment	The extrusive rocks	andesite and dacite porphyry	Rb-Sr	620 ± 16	WR	isochrone	formation	ARC		53
143	32.9550	27.9450	cop	Egypt	Northern Nubian Shield	the Ras Gharib segment	the Ras Gharib segment	granodiorite-leucogranite	Rb-Sr	552 ± 7	WR	isochrone	intrusion	ARC		53
144	32.8910	27.9410	cop	Egypt	Northern Nubian Shield	the Ras Gharib segment	the Ras Gharib segment	trondhjemite	Rb-Sr	516 ± 7	WR	isochrone	intrusion	ARC		53
145	32.9230	27.9240	cop	Egypt	Northern Nubian Shield	the Ras Gharib segment	Dyke rocks	dolerite, dacite	Rb-Sr	493 ± 7	WR	isochrone	intrusion	LATE-OROGENIC		53
146	32.9210	28.1210	cop	Egypt	Northern Nubian Shield	the Ras Gharib segment	the Ras Gharib segment	peralkaline granite	Rb-Sr	476 ± 2	WR	isochrone	intrusion	INTRA-PLATE		53
147	-9.0250	29.5920	cop	Morocco	W Anti-Atlas	Kerdous Massif	Tarçouate Laccolith	granodiorite	U-Pb	583.2 ± 11.3	zircon	upper intercept	intrusion	ARC		54
148	-9.0300	29.6000	cop	Morocco	W Anti-Atlas	Kerdous Massif	Tarçouate Laccolith	gabbro-diorite	U-Pb	560.4 ± 1.7	zircon	upper intercept	intrusion	ARC		54
149	-10.6903	28.4438	cop	Morocco	W Anti-Atlas	Bas Drâa inlier	Taurgha	granite	U-Pb	575.3 ± 1.7	zircon	upper intercept	intrusion	POST-OROGENIC		54
150	-9.0560	29.5580	cop	Morocco	W Anti-Atlas	Kerdous Massif	Agouni Yessen pluton	granitoid	Rb-Sr	549 ± 6	WR	isochrone	intrusion	ARC	55	56
151	-8.9820	29.6970	cop	Morocco	W Anti-Atlas	Kerdous Massif	Tafraoute plutons	granitoid	Rb-Sr	549 ± 6	WR	isochrone	intrusion	ARC	55	56
152	44.1790	23.0900	cop	Saudi Arabia	Central Arabian Shield	Sequence A	Hummah suite	andesite, dacite and rhyolite	Rb-Sr	573 ± 23	WR	isochrone	eruption	ARC		57
153	43.2990	22.5110	cop	Saudi Arabia	Central Arabian Shield	Sequence A	Jahhad suite	andesite, dacite and rhyolite	Rb-Sr	616 ± 13	WR	isochrone	eruption	ARC		57
154	42.7730	21.1480	cop	Saudi Arabia	Central Arabian Shield	Sequence A	Arfan suite	andesite, dacite and rhyolite	Rb-Sr	608 ± 9	WR	isochrone	eruption	ARC		57
155	42.8780	21.1830	cop	Saudi Arabia	Central Arabian Shield	Sequence A	Juqjuq suite	andesite, dacite and rhyolite	Rb-Sr	612 ± 22	WR	isochrone	eruption	ARC		57
156	39.3203	21.4160	cop	Saudi Arabia	Central Arabian Shield	Sequence A	Fatimah suite	andesite, dacite and rhyolite	Rb-Sr	688 ± 30	WR	isochrone	eruption	ARC		57

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157	-6.7280	30.4930	fm	Morocco	Anti-Atlas Mountains	Bou Azzer inlier	Tazigzaout inlier	augen granite gneiss	U-Pb	753 ± 1/ -2	zircon	upper intercept	intrusion	ARC		58
158	-6.7300	30.4870	fm	Morocco	Anti-Atlas Mountains	Bou Azzer inlier	Tazigzaout inlier	fine-grained granite	U-Pb	701 ± 2/ -1	zircon	upper intercept	intrusion	ARC		58
159	-6.7320	30.4860	fm	Morocco	Anti-Atlas Mountains	Bou Azzer inlier	Tazigzaout inlier	metagabbro	U-Pb	752 ± 1/ -2	zircon	upper intercept	intrusion	ARC		58
160	-6.7380	30.4830	fm	Morocco	Anti-Atlas Mountains	Bou Azzer inlier	Tazigzaout inlier	medium-grained granite	U-Pb	705 +2/-3	zircon	upper intercept	intrusion	ARC		58
161	-6.4770	30.4595		Morocco	Anti-Atlas Mountains	Bou Azzer inlier	Aït Abdulla	diorit	U-Pb	653.8±1.6	zircon	upper intercept	intrusion	SYN-OROGENIC		59
162	-6.9874	30.5478		Morocco	Anti-Atlas Mountains	Bou Azzer inlier	Bou Offroh	granodiotrite	U-Pb	653.0±1.3	zircon	upper intercept	intrusion	SYN-OROGENIC		59
163	-6.5814	30.4862		Morocco	Anti-Atlas Mountains	Bou Azzer inlier	Ousdrat	diorite	U-Pb	640.8± 1.4	zircon	upper intercept	intrusion	SYN-OROGENIC		59
164	-6.6583	30.4321		Morocco	Anti-Atlas Mountains	Bou Azzer-El Graara inlier	Bou Azzer ophiolite	ophiolitic gabbro	U-Pb	697±8	zircon	SHRIMP	formation	ARC		60
165	-6.6628	30.5155		Morocco	Anti-Atlas Mountains	Bou Azzer-El Graara inlier	Bou Zben pluton	granitoids	U-Pb	632±12	zircon	SHRIMP	formation	ARC		60
166	-6.9779	30.5465		Morocco	Anti-Atlas Mountains	Bou Azzer-El Graara inlier	Bou Offroh pluton	quartz-diorite	U-Pb	659±8	zircon	SHRIMP	formation	ARC		60
167	-6.7928	30.5139		Morocco	Anti-Atlas Mountains	Bou Azzer-El Graara inlier	Oumlill	mylonitic leucogranite	U-Pb	741±9	zircon	SHRIMP	formation	RIFTING		60
168	34.9270	29.5260	cop	Israel	Arabian-Nubian Shield	Elat granite	Wadi Shelomo pluton	pegmatite vein	Rb-Sr	621 ± 12	WR	isochrone	intrusion	LATE/POST-OROGENIC		61
169	34.9380	29.5600	cop	Israel	Arabian-Nubian Shield	Elat granite	Wadi Shahmon pluton	monzogranite (meta-)	Rb-Sr	640 ± 9	WR-Ms	isochrone	intrusion	METAMORPHISM		61
170	-8.7080	29.4830	fm	Morocco	Anti-Atlas	Tagragra d'Akka Inlier	Tagragra d'Akka Inlier	dacite	U-Pb	600 ± 5	zircon	SHRIMP	intrusion	ARC		62
171	-6.4880	30.3720		Morocco	Anti-Atlas	Bou Azzer inlier	Bleïda	granodiorite	U-Pb	579.4 ± 1.2	zircon	upper intercept	intrusion	POST-OROGENIC		63
172	-6.4660	30.3620		Morocco	Anti-Atlas	Bou Azzer inlier	Bleïda	granodiorite	U-Pb	578.5 ± 1.2	zircon	upper intercept	intrusion	POST-OROGENIC		63
173	0.9960	18.3960	fm, cop	Mali	Trans-Saharan mobile belt	Iforas batholith	Yenchichi south	granite	Rb-Sr	544 ±16	WR	isochron	intrusion	POST-OROGENIC		64
174	1.0410	18.8740	fm, cop	Mali	Trans-Saharan mobile belt	Iforas batholith	Timedjelalen ring-complex central part	rhyolitic lavas	Rb-Sr	561 ±7	WR	isochron	intrusion	POST-OROGENIC		64
175	1.3210	18.4600	fm, cop	Mali	Trans-Saharan mobile belt	Iforas batholith	Kidal ring-complex Lavas south	peralkalinc granite	Rb-Sr	543±9	WR	isochron	intrusion	POST-OROGENIC		64
176	1.3130	19.1890	fm, cop	Mali	Trans-Saharan mobile belt	Iforas batholith	N-S dykes central part	microsyenites (alkaline volcanics)	Rb-Sr	561 ±7	WR	isochron	intrusion	POST-OROGENIC		64
177	1.0620	19.0400	fm, cop	Mali	Trans-Saharan mobile belt	Iforas batholith	Tahrmert central part	alkaline granite	Rb-Sr	541±7	WR	isochron	intrusion	POST-OROGENIC		64

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178	1.0200	18.3910	fm, cop	Mali	Trans-Saharan mobile belt	Iforas batholith	Yenchichi south	syenogranite	Rb-Sr	577 ±1	WR	isochron	intrusion	POST-OROGENIC		64
179	1.2520	19.0510	fm, cop	Mali	Trans-Saharan mobile belt	Iforas batholith E-W dykes	Telabit central part	quartz-two-feldspar porphyry	Rb-Sr	544 ±12	WR	isochron	cooling age (intrusion	POST-OROGENIC		64
180	1.2520	19.0510	fm, cop	Mali	Trans-Saharan mobile belt	Iforas batholith E-W dykes	Dohendal central part	quartz-two-feldspar porphyry	Rb-Sr	556 ±10	WR	isochron	cooling age (intrusion	POST-OROGENIC		64
181	1.2520	19.0510	fm, cop	Mali	Trans-Saharan mobile belt	Iforas batholith E-W dykes	Yenchichi south	quartz-two-feldspar porphyry	Rb-Sr	565 ±14	WR	isochron	cooling age (intrusion	POST-OROGENIC		64
182	0.9180	19.1300	fm, cop	Mali	Trans-Saharan mobile belt	Iforas batholith	Aoukenek monzo-granite (central part)	monzo- granite	Rb-Sr	591 ±18	WR	isochron	cooling age (intrusion	SYN-OROGENIC		64
183	1.0900	18.3420	fm, cop	Mali	Trans-Saharan mobile belt	Iforas batholith	Adma south	granodiorite	Rb-Sr	595±24	WR	isochron	cooling age (intrusion	SYN-OROGENIC		64
184	1.3210	20.2690	fm, cop	Mali	Trans-Saharan mobile belt	Iforas batholith	Tin Seyed north	q-monzodiorite	Rb-Sr	581±15	WR	isochron	cooling age (intrusion	SYN-OROGENIC		64
185	0.8640	18.6760	fm, cop	Mali	Trans-Saharan mobile belt	Iforas batholith	Erecher tonalite south	tonalite	Rb-Sr	602 ±13	WR	isochron	cooling age (intrusion	SYN-OROGENIC		64
186	1.7010	19.1000	fm, cop	Mali	Trans-Saharan mobile belt	Iforas batholith	Ibdeken granodiorite south	granodiorite	Rb-Sr	613 ±29	WR	isochron	intrusion	SYN-OROGENIC		64
187	1.0960	18.3480	fm, cop	Mali	Trans-Saharan mobile belt	Iforas batholith	Adma granodiorite south	granodiorite	Rb-Sr	620 ±6	WR	isochron	intrusion	ARC		64
188	1.2330	18.8460	fm, cop	Mali	Trans-Saharan mobile belt	Iforas batholith	Tafeliant dykes south	volcanics?	Rb-Sr	634 ±15	WR	isochron	intrusion	ARC		64
189	1.3630	18.0010	fm, cop	Mali	Trans-Saharan mobile belt	Iforas batholith	Teggart south	q-diorite	Rb-Sr	696 ±5	WR	isochron	intrusion	ARC		64
190	8.6460	21.9490	fm, cop	Algeria	Saharan metacraton	Tuareg shield	Hanane pluton	granodiorite	U-Pb	582 ± 3	zircon	concordant age	intrusion	FAULTING		65
191	8.3990	21.5630	fm, cop	Algeria	Saharan metacraton	Tuareg shield	Yvonne granite	granite	U-Pb	595 ± 3	zircon	concordant age	intrusion	FAULTING		65
192	8.6110	22.0400	fm, cop	Algeria	Saharan metacraton	Tuareg shield	Ohergehem pluton	biotite-bearing granodiorite	U-Pb	594±4	zircon	concordant age	intrusion	FAULTING		66
193	8.5890	22.3940	fm, cop	Algeria	Saharan metacraton	Tuareg shield	Arigher batholith	granodiorite	U-Pb	554±5	zircon	concordant age	intrusion	FAULTING		66
194	8.4480	22.7200	fm, cop	Algeria	Saharan metacraton	Tuareg shield	Touffok pluton	granitoid	U-Pb	793±4	zircon	concordant age	intrusion	FAULTING		66
195	8.6167	22.0667	fm	Algeria	Saharan metacraton	Eastern Hoggar	Tiririne Formation	monzonite dyke	U-Pb	660 ±5	zircon	concordant age	intrusion	PRE-OROGENIC		67
196	8.4030	22.7770	fm, cop	Algeria	Saharan metacraton	Tuareg shield	Adaf pluton	foliated adamellite	U-Pb	604±13	zircon	concordant age	intrusion	SYN-OROGENIC		67

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197	8.4167	23.7833	fm	Algeria	Saharan metacraton	Tuareg shield	Adaf pluton	porphyritic adamellite	U-Pb	585±14	zircon	concordant age	intrusion	LATE-OROGENIC		67
198	34.4830	25.0160	cop	Egypt	Nubian Shield	Central eastern desert	Sheikh Salem pluton	quartz monzonite	Rb-Sr	597 ± 16	WR	isochron	intrusion	POST-OROGENIC	68	69
199	34.4300	25.5040	cop	Egypt	Nubian Shield	Central eastern desert	Kadabora pluton	quartz monzonite	Rb-Sr	607 ± 8	WR	isochron	intrusion	POST-OROGENIC	68	69
200	33.8700	26.7300	cop	Egypt	Nubian Shield	Central eastern desert	Dokhan Formation	andesite – rhyolite	Rb-Sr	602 ± 12	WR	isochron	eruption	ARC	68	30
201	33.0750	27.8400	cop	Egypt	Nubian Shield	Central eastern desert	Dokhan Formation	lithic-ignimbrite	U-Pb	615±4	zircon	SHRIMP	eruption	ARC	70	71
202	33.0580	27.8580	cop	Egypt	Nubian Shield	Central eastern desert	Dokhan Formation	crystal-poor ignimbrite	U-Pb	616±5.4	zircon	SHRIMP	eruption	ARC	70	71
203	34.8300	29.6520	cop	Israel	Arabian-Nubian Massif	Elat Volcanics	Hare Neshef	alkaline rhyolite	Rb-Sr	529 ± 12	WR	isochron	eruption	RIFTING	72	73,74
204	35.3740	30.2840	cop	Jordan	Arabian-Nubian Massif	Elat Volcanics	NE Wadi Abu Khusheiba	alkaline rhyolite	Rb-Sr	527 ± 3	WR	isochron	eruption	RIFTING	72	75
205	34.8910	29.4970	cop	Israel	Arabian-Nubian Massif	Elat Volcanics	Wadi Tweibe	alkaline rhyolite	Rb-Sr	483±13	WR	isochron	eruption	RIFTING	72	73, 74
206	35.2580	30.0740	cop	Israel	Arabian-Nubian Massif	Elat Volcanics	Gharandal	alkaline rhyolite	Rb-Sr	535± 15	WR	isochron	eruption	RIFTING	72	75
207	35.3040	30.2410	cop	Israel	Arabian-Nubian Massif	Elat Volcanics	S Wadi Abu Khusheiba	rhyodacite	Rb-Sr	633 ± 14	WR	isochron	eruption	RIFTING	72	75
208	34.9120	29.5230	cop	Israel	Arabian-Nubian Massif	Elat Volcanics	Nahal Shelomo	rhyodacite	Rb-Sr	548 ± 4	WR	isochron	eruption	RIFTING	72	73, 74
209	35.2500	22.8500		Egypt	Arabian-Nubian Massif	Easter Desert	Wadi Kreiga	tonalite	Rb-Sr	709	WR	model ages	intrusion	ARC		76
210	33.9000	22.5170		Egypt	Arabian-Nubian Massif	Easter Desert	Abu Swayel	rhyodacite	Rb-Sr	768 ± 31	WR	isochron	eruption	ARC		76
211	35.2670	23.2670		Egypt	Arabian-Nubian Massif	Easter Desert	Gebel Farid	granite	Rb-Sr	587 ± 11	felds.-WR	isochron	intrusion	RIFTING		76
212	32.8900	24.0500		Egypt	Arabian-Nubian Massif	Easter Desert	Aswan	k-feldspar granite	U-Pb	594 ±4	zircon	upper intercept	intrusion	RIFTING		76
213	34.4600	24.7000	cop	Egypt	Arabian-Nubian Massif	Easter Desert	Hafafit	tonalite	U-Pb	682	zircon	upper intercept	intrusion	SYN-OROGENIC		76
214	33.7500	25.2500		Egypt	Arabian-Nubian Massif	Easter Desert	Wadi El Mia	granodiorite	Rb-Sr	674 ± 13	WR	isochron	intrusion	SYN-OROGENIC		76
215	33.6500	25.7500		Egypt	Arabian-Nubian Massif	Easter Desert	Wadi El Mahdaf	metavolcanic	Rb-Sr	622 ± 6	WR	isochron	eruption	ARC		76
216	33.7500	26.0000		Egypt	Arabian-Nubian Massif	Easter Desert	Abu Ziran	granodiorite	U-Pb	614 ± 8	zircon	upper intercept	intrusion	ARC		76
217	33.4833	26.8167		Egypt	Arabian-Nubian Massif	Easter Desert	Mons Claudianus	granodiorite	U-Pb	666	zircon	single grain	intrusion	ARC		76

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
218	33.7500	26.5500		Egypt	Arabian-Nubian Massif	Easter Desert	Gegel Nuqrah	andesite	Rb-Sr	581 ±7	WR	isochron	eruption	RIFTING		76
219	33.3667	24.1167		Egypt	Arabian-Nubian Massif	Easter Desert	Gegel Qattar	pink granite	U-Pb	579	zircon	single grain	intrusion	RIFTING		76
220	32.3667	27.1833		Egypt	Arabian-Nubian Massif	Easter Desert	Salah El Belih	granodiorite	U-Pb	583	zircon	single grain	intrusion	RIFTING		76
221	33.2833	27.2500		Egypt	Arabian-Nubian Massif	Easter Desert	Gegel Dokhan	andesite and dacite volcanics	Rb-Sr	592 ± 13	WR	isochron	eruption	RIFTING		76
222	33.3333	27.2167	cop	Egypt	Arabian-Nubian Massif	Easter Desert	Qattar Dokhan area	rhyolite and andesite dykes	Rb-Sr	589 ±4	felds.-WR	isochron	eruption	RIFTING		76
223	32.9167	27.6000		Egypt	Arabian-Nubian Massif	Easter Desert	Wadi Dib	granodiorite	U-Pb	620	zircon	single grain	intrusion	ARC		76
224	33.0333	27.8000		Egypt	Arabian-Nubian Massif	Easter Desert	Wadi Dib	felsic dyke	Rb-Sr	550	WR	model ages	intrusion	RIFTING		76
225	33.0500	27.9167		Egypt	Arabian-Nubian Massif	Easter Desert	Gebel Dara	pink granite	U-Pb	596	zircon	single grain	intrusion	RIFTING		76
226	33.0500	27.9167		Egypt	Arabian-Nubian Massif	Easter Desert	Gebel Dara	rhyolite dyke	Rb-Sr	~543	WR	model ages	intrusion	RIFTING		76
227	33.4833	27.9667		Egypt	Arabian-Nubian Massif	Easter Desert	Gebel Zeit	riebeckite granite	Rb-Sr	~592	WR	model ages	intrusion	RIFTING		76
228	32.1000	28.1333		Egypt	Arabian-Nubian Massif	Easter Desert	Gebel Gharib	riebeckite alkali granite	Rb-Sr	~544	WR	model ages	intrusion	RIFTING		76
229	32.5667	28.4167	cop	Egypt	Arabian-Nubian Massif	Easter Desert	Wadi Hawashiya and Gazalla	pink granite	Rb-Sr	577 ±6	WR	isochron	intrusion	RIFTING		76
230	32.5833	28.5333		Egypt	Arabian-Nubian Massif	Easter Desert	Um Tennasib	granite dyke	Rb-Sr	575 ±11	WR	isochron	intrusion	RIFTING		76
231	33.6730	28.7090	fm	Egypt	Arabian-Nubian Massif	Sinai	Feiran basement	basalt-rhyolite dyke	Rb-Sr	591 ± 9	WR	isochron	intrusion	RIFTING		77
232	33.7180	28.6950	fm	Egypt	Arabian-Nubian Massif	Sinai	Feiran basement	hb-Bt orthogneiss	U-Pb	782 ± 7	zircon	upper intercept	intrusion			77
233	35.5667	29.9667		Israel	Arabian-Nubian shield	Elat Metamorphic Complex	Umm-Zeriq gneiss	orthogneiss	U-Pb	735 ± 29	zircon	SHRIMP II	intrusion	ARC		78
234	34.8833	30.3167		Israel	Arabian-Nubian shield	Elat Metamorphic Complex	Morakh gneiss	orthogneiss	U-Pb	611 ± 15	zircon	SHRIMP II	intrusion	POST-OROGENIC		78
235	35.0500	30.1167		Israel	Arabian-Nubian shield	Elat Metamorphic Complex	Umm-Maghra gneiss	orthogneiss	U-Pb	630 ± 13	zircon	SHRIMP II	intrusion	POST-OROGENIC		78
236	34.9833	29.5667		Israel	Arabian-Nubian shield	Elat Metamorphic Complex	Shahmon gneiss	orthogneiss	U-Pb	628 ± 6.3	zircon	SHRIMP II	intrusion	POST-OROGENIC		78

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
237	34.9000	29.7333		Israel	Arabian-Nubian shield	Elat Metamorphic Complex	quartz syenite granophyre	quartz syenite granophyre	U-Pb	587.7 ± 5.6	zircon	SHRIMP II	intrusion	INTRA-PLATE		78
238	34.5690	24.6040	fm	Egypt	East Saharan Croton	Eastern Desert	Wadi Hafafit area	trondhjemites	Pb-Pb	700 ± 12	zircon	evaporation	emplacement	ARC		79
239	34.5740	24.6240	fm	Egypt	East Saharan Croton	Eastern Desert	Wadi Hafafit area	trondhjemites	Pb-Pb	698 ± 14	zircon	evaporation	emplacement	ARC		79
240	34.5880	24.6380	fm	Egypt	East Saharan Croton	Eastern Desert	Wadi Hafafit area	granite	Pb-Pb	677 ± 9	zircon	evaporation	emplacement	ARC		79
241	35.0120	23.3940	nc	Egypt	East Saharan Croton	Eastern Desert	Wadi Bitan gneiss	granitic gneiss	Pb-Pb	704 ± 8	zircon	evaporation	emplacement	ARC		79
242	33.8000	28.7000	cop	Egypt	East Saharan Croton	Eastern Desert	Wadi Feiran gneiss	granitoid orthogneiss	Pb-Pb	796 ±6	zircon	evaporation	emplacement	ARC		79
243	33.6056	26.0026		Egypt	East Saharan Croton	Meatiq Gneiss Dome	Meatiq Gneiss Dome	felsite	U-Pb	747.8 ± 3	zircon	ID-TIMS	crystallization	ARC		80
244	33.5706	25.9994		Egypt	East Saharan Croton	Meatiq Gneiss Dome	Fawakhir	monzodiorite	U-Pb	597.8 ± 2.9	zircon	ID-TIMS	crystallization	POST-OROGENIC		80
245	33.8442	26.1442		Egypt	East Saharan Croton	Meatiq Gneiss Dome	Um Ba'anib	orthogneiss	U-Pb	630.8 ± 2.0	zircon	ID-TIMS	crystallization			80
246	33.8542	26.1539		Egypt	East Saharan Croton	Meatiq Gneiss Dome	Abu Fannani Thrust Sheet	dioritic lens	Pb-Pb	609.0 ± 1.0	zircon	ID-TIMS	crystallization	SYN-OROGENIC		80
247	33.8498	26.1614		Egypt	East Saharan Croton	Meatiq Gneiss Dome	Abu Fannani Thrust Sheet	dioritic lens 2	U-Pb	605.8 ± 0.9	zircon	ID-TIMS	crystallization	SYN-OROGENIC		80
248	33.8326	26.0000		Egypt	East Saharan Croton	Meatiq Gneiss Dome	Abu Ziran	diorite	U-Pb	606.4 ± 1.0	zircon	ID-TIMS	crystallization	SYN-OROGENIC		80
249	33.7812	26.0691		Egypt	East Saharan Croton	Meatiq Gneiss Dome	Arieki pluton	granite	U-Pb	590.5 ± 3.1	zircon	ID-TIMS	crystallization	POST-OROGENIC		80
250	33.5121	26.0213		Egypt	East Saharan Croton	Meatiq Gneiss Dome	Um Had	granite	U-Pb	596.3 ± 1.7	zircon	ID-TIMS	crystallization	POST-OROGENIC		80
251	33.7180	26.0350	fm	Egypt	East Saharan Croton	Meatiq Core Complex	Meatiq Core Complex	sheared metapelite	Ar-Ar	588 ± 0.5	muscovite	?	Sinistral strike-slip exhumation	FAULTING	81	82
252	33.7890	26.0000	fm	Egypt	East Saharan Croton	Meatiq Core Complex	Meatiq Core Complex	sheared granite	Ar-Ar	595 ± 0.5	muscovite	?	Sinistral strike-slip exhumation	FAULTING	81	82
253	33.7790	26.1040	fm	Egypt	East Saharan Croton	Meatiq Core Complex	Arieki pluton	granite	Rb-Sr	579.5 ± 6	WR	isochrone	emplacement	POST-OROGENIC	81	83
254	33.7970	26.1420	fm	Egypt	East Saharan Croton	Meatiq Core Complex	Um Baanib gneiss	amphibolite	Ar-Ar	580.3 ±0.3	hornblende	plateau	Sinistral strike-slip exhumation	FAULTING		81
255	33.8130	26.1350	fm	Egypt	East Saharan Croton	Meatiq Core Complex	Um Baanib gneiss	amphibolite	Ar-Ar	587.3 ±0.2	hornblende	plateau	Sinistral strike-slip exhumation	FAULTING		81
256	33.8400	26.0360	fm	Egypt	East Saharan Croton	Meatiq Core Complex	Um Baanib gneiss	amphibolite	Ar-Ar	579.1 ±0.2	hornblende	plateau	Sinistral strike-slip exhumation	FAULTING		81

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
257	33.8410	26.1360	fm	Egypt	East Saharan Croton	Meatiq Core Complex	Um Baanib gneiss	amphibolite	Ar-Ar	583.9 ±0.2	hornblende	plateau	Sinistral strike-slip exhumation	FAULTING		81
258	33.7900	26.0150	fm	Egypt	East Saharan Croton	Meatiq Core Complex	Meatiq	garnet kyanite schists	Ar-Ar	582.3 ±0.2	muscovite	plateau	Sinistral strike-slip exhumation	FAULTING		81
259	34.2520	25.6760	fm	Egypt	East Saharan Croton	Sibai Core Complex	Sibai	amphibolite	Ar-Ar	606.7 ±0.2	hornblende	plateau	cooling age (exhumation)	RIFTING		81
260	34.3140	25.6190	fm	Egypt	East Saharan Croton	Sibai Core Complex	Abu Markhat gneiss	amphibolite	Ar-Ar	623.6 ±0.2	hornblende	plateau	cooling age (exhumation)	RIFTING		81
261	34.5110	24.8120	fm	Egypt	East Saharan Croton	Sibai Core Complex	Hafafit Core Complex	orthogneisses	Ar-Ar	586.1 ±0.3	hornblende	plateau	cooling age (exhumation)	RIFTING		81
262	34.5080	24.7780	fm	Egypt	East Saharan Croton	Sibai Core Complex	Hafafit Core Complex	orthogneisses	Ar-Ar	584.2 ±0.2	hornblende	plateau	cooling age (exhumation)	RIFTING		81
263	34.9957	24.7482		Egypt	East Saharan Croton	Eastern Desert	Wadi Ghadir ophiolite	plagiogranite	Pb-Pb	746 ±19	zircon	evaporation	formation	ARC	84	85
264	33.7186	22.6729		Egypt	East Saharan Croton	Eastern Desert	Abu Swayel ophiolite	gabbro	Pb-Pb	729 ± 17	zircon	evaporation	formation	ARC	84	85
265	33.7116	22.6669		Egypt	East Saharan Croton	Eastern Desert	Abu Swayel ophiolite	diorite	Pb-Pb	736 ± 1 1	zircon	evaporation	formation	ARC	84	85
266	35.0044	22.5448		Sudan	East Saharan Croton	Eastern Desert	Jabal Gerf ophiolite	layered gabbro	Pb-Pb	741 ± 21	zircon	evaporation	formation	ARC	84	85
267	35.9257	21.5716		Sudan	East Saharan Croton	Eastern Desert	Onib ophiolite	plagiogranite	Pb-Pb	808 ±14	zircon	evaporation	formation	ARC	84	85
268	35.9248	21.5633		Sudan	East Saharan Croton	Eastern Desert	Onib	leucogranites	Pb-Pb	713 ± 12	zircon	evaporation	formation	ARC	84	85
269	35.9331	21.5598		Sudan	East Saharan Croton	Eastern Desert	Onib	leucogranites	Pb-Pb	714 ± 5	zircon	evaporation	formation	ARC	84	85
270	35.9495	21.5985		Sudan	East Saharan Croton	Eastern Desert	Wadi Onib	leucogranites	Pb-Pb	646 ±10	zircon	evaporation	formation	INTRA-PLATE	84	85
271	33.1700	22.8300		Egypt	East Saharan Croton	Eastern Desert	Allaqi	felsic dyke	Pb-Pb	770 ± 9	zircon	evaporation	formation	ARC	84	85
272	33.8040	26.1440	cop	Egypt	East Saharan Croton	Eastern Desert	Meatiq metamorphic core complex	ortho-amphibolite xenolith	Pb-Pb	819 ±38	zircon	evaporation	formation	RIFTING		86
273	33.7720	26.0800	cop	Egypt	East Saharan Croton	Eastern Desert	Meatiq metamorphic core complex	ophiolitic cover	Pb-Pb	788 ±13	zircon	evaporation	formation	RIFTING		86
274	33.8520	26.0870	cop	Egypt	East Saharan Croton	Eastern Desert	Um Baanib	granitic gneiss	Pb-Pb	779 ±4	zircon	evaporation	formation	RIFTING		86
275	33.8360	26.0000	cop	Egypt	East Saharan Croton	Eastern Desert	Meatiq metamorphic core complex	granitic stock	Pb-Pb	644 ±20	zircon	evaporation	formation	SYN-OROGENIC		86
276	34.2310	25.2310	cop	Egypt	East Saharan Croton	central Eastern Desert	Abu-Diab	granite	Rb-Sr	585±24	WR	isochron	formation	RIFTING		87

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
277	34.5700	24.7150	fm	Egypt	East Saharan Croton	central Eastern Desert	Wadi Hafafit Culmination	biotite-gneiss	Rb-Sr	573±6	WR-Bt-Plg	isochron	cooling	RIFTING		88
278	34.5750	24.6720	fm	Egypt	East Saharan Croton	central Eastern Desert	Wadi Hafafit Culmination	hornblende-gneiss	Sm-Nd	585±8	WR-Gr-Plg	isochron	cooling from the thermal peak	RIFTING		88
279	34.5720	24.7410	fm	Egypt	East Saharan Croton	central Eastern Desert	Wadi Hafafit Culmination	amphibolite	Sm-Nd	593±4	WR-Gr-Plg	isochron	cooling from the thermal peak	RIFTING		88
280	34.0394	25.9419		Egypt	East Saharan Croton	central Eastern Desert	Wadi Kareim	basalt	U-Pb	730±22	zircon	SHRIMP-RG	formation	ARC		89
281	34.0358	25.9442		Egypt	East Saharan Croton	central Eastern Desert	Wadi Kareim	Diabase	U-Pb	743±45	zircon	SHRIMP-RG	formation	ARC		89
282	34.0375	25.9478		Egypt	East Saharan Croton	central Eastern Desert	Wadi Kareim	Felsic Tuff	U-Pb	769±29	zircon	SHRIMP-RG	formation	ARC		89
283	34.1517	25.8317		Egypt	East Saharan Croton	central Eastern Desert	Wadi El Dabbah	andesite	U-Pb	734 ± 7	zircon	SHRIMP-RG	formation	ARC		89
284	33.9510	22.2260		Egypt	south Eastern Desert	Allaqi–Heiani Suture	Wadi Abu-Fas	layered gabbro	U-Pb	730±6	zircon	SHRIMP II	crystallization age	OCEANIC		90
285	34.0530	22.1860		Egypt	south Eastern Desert	Allaqi–Heiani Suture	Jabal Moqsim	gabbro	U-Pb	697±5	zircon	SHRIMP II	crystallization age	OCEANIC		90
286	33.7660	22.6310		Egypt	south Eastern Desert	Allaqi–Heiani Suture	Wadi Shilman	metavolcanic	U-Pb	733±7	zircon	SHRIMP II	crystallization age	ARC		90
287	33.5970	22.6830		Egypt	south Eastern Desert	Allaqi–Heiani Suture	Wadi Shilman	granodiorite	U-Pb	629±5	zircon	SHRIMP II	crystallization age	SYN-OROGENIC		90
288	33.2170	22.8630		Egypt	south Eastern Desert	Allaqi–Heiani Suture	Wadi Um Ashirah	quartz-diorite	U-Pb	709±4	zircon	SHRIMP II	crystallization age	OCEANIC		90
289	33.6650	25.5350	fm	Egypt	East Saharan Croton	central Eastern Desert	Gabel El Shalul area	granite	U-Pb	637 ± 5	zircon	LA-ICP-MS	crystallization age	INTRA-PLATE		91
290	33.6750	25.5440	fm	Egypt	East Saharan Croton	central Eastern Desert	Gabel El Shalul area	granite	U-Pb	631 ± 6	zircon	LA-ICP-MS	crystallization age	INTRA-PLATE		91
291	34.9436	23.4556		Egypt	East Saharan Croton	south Eastern Desert	Wadi Beitan granitoid	tonalitic gneiss	U-Pb	719 ± 10	zircon	SHRIMP II	magmatic emplacement	ARC		92
292	35.0049	23.2959		Egypt	East Saharan Croton	south Eastern Desert	Wadi Beitan granitoid	Granodioritic gneiss	U-Pb	725 ± 9	zircon	SHRIMP II	magmatic emplacement	ARC		92
293	35.0090	23.3326		Egypt	East Saharan Croton	south Eastern Desert	Wadi Beitan granitoid	tonalitic to granodioritic gneiss	U-Pb	744 ± 10	zircon	SHRIMP II	magmatic emplacement	ARC		92
294	34.5643	29.0577		Egypt	East Saharan Croton	south Eastern Desert	Wadi Ghazala	granite	U-Pb	582 ± 6	zircon	SHRIMP	crystallization age	RIFTING		93
295	34.2813	28.5001		Egypt	East Saharan Croton	south Eastern Desert	Wadi Nasb	granite	U-Pb	594 ± 8	zircon	SHRIMP	crystallization age	RIFTING		93
296	34.0706	28.0472		Egypt	East Saharan Croton	south Eastern Desert	Wadi Lithi	monzogranite	U-Pb	594 ± 14	zircon	SHRIMP	crystallization age	RIFTING		93

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297	34.0835	28.0167		Egypt	East Saharan Croton	south Eastern Desert	Wadi Lithi	alkali-granite	U-Pb	579 ± 9	zircon	SHRIMP	crystallization age	RIFTING		93
298	33.7678	28.9847		Egypt	East Saharan Croton	south Eastern Desert	Wadi Seih	alkali-granite	U-Pb	591 ± 6	zircon	SHRIMP	crystallization age	RIFTING		93
299	34.2200	25.6283		Egypt	central Eastern Desert	El-Sibai area	El-Shush	granodioritic gneiss	U-Pb	682 ± 4	zircon	ID-TIMS	crystallization age	ARC		94
300	34.2200	25.6283		Egypt	central Eastern Desert	El-Sibai area	El-Shush	granitic gneiss	U-Pb	679 ± 2	zircon	ID-TIMS	crystallization age	ARC		94
301	34.2169	25.6277		Egypt	central Eastern Desert	El-Sibai area	El-Shush	coarse granitic gneiss	U-Pb	685 ± 3	zircon	ID-TIMS	crystallization age	ARC		94
302	34.4322	25.6201		Egypt	central Eastern Desert	El-Sibai area	Umm Gheigh	anorthosite	U-Pb	541 ± 2	zircon	ID-TIMS	crystallization age	RIFTING		94
303	34.4368	25.6149		Egypt	central Eastern Desert	El-Sibai area	Umm Gheigh	syenogranite dyke	U-Pb	540 ± 2	zircon	ID-TIMS	crystallization age	RIFTING		94
304	34.2252	25.6190		Egypt	East Saharan Croton	Eastern Desert	Sibai core complex	orthogneiss	Pb-Pb	694 ±27	zircon	evaporation	crystallization age	ARC	84	95
305	34.2600	25.6093		Egypt	East Saharan Croton	Eastern Desert	Sibai core complex	orthogneiss	Pb-Pb	679 ±7	zircon	evaporation	crystallization age	ARC	84	95
306	34.2391	25.6376		Egypt	East Saharan Croton	Eastern Desert	Sibai core complex	orthogneiss	Pb-Pb	659 ±14	zircon	evaporation	crystallization age	ARC	84	95
307	34.2490	25.7750		Egypt	East Saharan Croton	Eastern Desert	Sibai core complex	granite	Pb-Pb	654 ±34	zircon	evaporation	Exhumation-related	INTRA-PLATE	84	95
308	34.2758	25.7091		Egypt	East Saharan Croton	Eastern Desert	Sibai core complex	granite	Pb-Pb	653 ±15	zircon	evaporation	Exhumation-related	INTRA-PLATE	84	95
309	34.2391	25.6376		Egypt	East Saharan Croton	Eastern Desert	Sibai core complex	granite	Pb-Pb	645 ±5	zircon	evaporation	Exhumation-related	INTRA-PLATE	84	95
310	34.2391	25.6376		Egypt	East Saharan Croton	Eastern Desert	Sibai core complex	orthogneiss	Pb-Pb	658 ± 16	zircon	evaporation	crystallization age	ARC	84	95
311	34.1848	25.7472		Egypt	East Saharan Croton	Eastern Desert	Sibai core complex	granite	Pb-Pb	657 ± 24	zircon	evaporation	crystallization age	ARC	84	95
312	34.5553	24.8221		Egypt	East Saharan Croton	Central and South Eastern Desert	Nugrus	biotite granite	U-Pb	595.1±3.7	zircon+titanite	ID-TIMS	crystallization age	POST-OROGENIC		96
313	34.5780	24.8400		Egypt	East Saharan Croton	Central and South Eastern Desert	Hangalia	granite	U-Pb	629.3±4.6	zircon	ID-TIMS	crystallization age	SYN-OROGENIC		96
314	34.7161	24.7668		Egypt	East Saharan Croton	Central and South Eastern Desert	Zabara	orthogneiss	U-Pb	632.5±4.6	zircon+polycrase	ID-TIMS	crystallization age	SYN-OROGENIC		96
315	34.5159	24.8105		Egypt	East Saharan Croton	Central and South Eastern Desert	Migmatitic	tonalite gneiss	U-Pb	590.1±1.9	titanite	ID-TIMS	age of metamorphism	FAULTING		96
316	34.5159	24.8105		Egypt	East Saharan Croton	Central and South Eastern Desert	Migmatitic	tonalite gneiss	U-Pb	658.8±5.3	zircon+titanite	ID-TIMS	crystallization age	SYN-OROGENIC		96

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317	34.9306	24.5597		Egypt	East Saharan Croton	Central and South Eastern Desert	El Sukkari	granite	U-Pb	689±2.5	zircon	ID-TIMS	crystallization age	SYN-OROGENIC		96
318	-5.0731	33.3853	nc	Morocco	Anti-Atlas Orogen	Bleïda Group	Iriri	orthogneiss	U-Pb	743 ±14	zircon	SHRIMP	magmatic age	ARC		97
319	-7.3880	30.0540	fm	Morocco	Anti-Atlas Orogen	Bou Salda Formation	Tadmant	rhyolites	U-Pb	605 ±9	zircon	SHRIMP	crystallization age	LATE/POST-OROGENIC		97
320	-7.7440	30.5260	fm	Morocco	Anti-Atlas Orogen	Bou Salda Formation	Tamriwine	rhyolites	U-Pb	606 ±6	zircon	SHRIMP	crystallization age	LATE/POST-OROGENIC		97
321	-7.6550	31.4570	fm	Morocco	Anti-Atlas Orogen	Assarag Suite	Amlouggui	tonalite	U-Pb	586±8	zircon	SHRIMP	magmatic age	LATE/POST-OROGENIC		97
322	-7.7820	30.6590	fm	Morocco	Anti-Atlas Orogen	Assarag Suite	Askaoun	granodiorite	U-Pb	575±8	zircon	SHRIMP	magmatic age	LATE/POST-OROGENIC		97
323	-7.6670	31.2180	fm	Morocco	Anti-Atlas Orogen	Assarag Suite	Tourcht	diorite	U-Pb	579±7	zircon	SHRIMP	magmatic age	LATE/POST-OROGENIC		97
324	-7.7160	30.2670	fm	Morocco	Anti-Atlas Orogen	Assarag Suite	Mzil	granite	U-Pb	614 ±10	zircon	SHRIMP	magmatic age	LATE/POST-OROGENIC		97
325	-7.7130	30.2680	fm	Morocco	Anti-Atlas Orogen	Sirwa Window	Mzil	granite	Rb-Sr	582 ±10	biotite-Wr	isochrone	cooling age (metamorphism)	RIFTING		97
326	-7.3570	30.0740	fm	Morocco	Anti-Atlas Orogen	Sirwa Window	Tilsakht	granite	Rb-Sr	525 ±12	biotite-Wr	isochrone	cooling age (metamorphism)	RIFTING		97
327	-7.6470	30.6010	fm	Morocco	Anti-Atlas Orogen	Sirwa Window	Askaoun	granite	Rb-Sr	559 ±8	biotite-Wr	isochrone	cooling age (metamorphism)	RIFTING		97
328	-7.3990	30.8580	fm	Morocco	Anti-Atlas Orogen	Ouarzazate Group	Tifhfist Formation	rhyolites	U-Pb	571 ±8	zircon	SHRIMP	crystallization age	POST-OROGENIC		97
329	-7.3410	29.5380	fm	Morocco	Anti-Atlas Orogen	Ouarzazate Group	Aguins Member	rhyolites	U-Pb	577 ±6	zircon	SHRIMP	crystallization age	POST-OROGENIC		97
330	-7.3570	30.0740	fm	Morocco	Anti-Atlas Orogen	Ouarzazate Group	Tilsakht	granite	U-Pb	579 ±7	zircon	SHRIMP	crystallization age	LATE/POST-OROGENIC		97
331	-7.8910	30.8750	fm	Morocco	Anti-Atlas Orogen	Ouarzazate Group	Imourkhsane	granite	U-Pb	562 ±5	zircon	SHRIMP	crystallization age	LATE/POST-OROGENIC		97
332	-7.6470	30.6010	fm	Morocco	Anti-Atlas Orogen	Achkoukchi Complex	Tazoult	quartz Porphyry	U-Pb	559 ±6	zircon	SHRIMP	crystallization age	LATE/POST-OROGENIC		97
333	5.2350	7.4820	fm	Nigeria	Arabian-Nubian Shield	SE Arabian Shield	Akure-Ikerre-Ado Ekiti association	charnockite	U-Pb	620 ±20	zircon	upper intercept	crystallization age	LATE-OROGENIC		98
334	5.1400	7.3230	fm	Nigeria	Arabian-Nubian Shield	SE Arabian Shield	Akure-Ikerre-Ado Ekiti association	charnockite	U-Pb	634 ±21	zircon	upper intercept	crystallization age	LATE-OROGENIC		98
335	5.2290	7.2640	fm	Nigeria	Arabian-Nubian Shield	SE Arabian Shield	Akure-Ikerre-Ado Ekiti association	granite	U-Pb	621 ±10	zircon	upper intercept	crystallization age	LATE-OROGENIC		98
336	5.1040	7.0280	fm	Nigeria	Arabian-Nubian Shield	SE Arabian Shield	Idanre association	charnockite	U-Pb	580 ±10	zircon	upper intercept	crystallization age	LATE-OROGENIC		98
337	5.1090	7.1180	fm	Nigeria	Arabian-Nubian Shield	SE Arabian Shield	Idanre association	charnockite	U-Pb	593 ± 13	zircon	upper intercept	crystallization age	LATE-OROGENIC		98
338	5.1320	7.0410	fm	Nigeria	Arabian-Nubian Shield	SE Arabian Shield	Idanre association	granite	U-Pb	587 ±10	zircon	upper intercept	crystallization age	LATE-OROGENIC		98

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
339	17.0900	13.0267		Chad	Central African Fold Belt	Central African Fold Belt	Guéra Massif	granite	U-Pb	568 ± 7	zircon	LA-ICP-MS	crystallization age	POST-OROGENIC		99
340	18.2783	12.6167		Chad	Central African Fold Belt	Central African Fold Belt	Guéra Massif	granite	U-Pb	595 ± 8	zircon	LA-ICP-MS	crystallization age	ARC		99
341	18.4817	10.8567		Chad	Central African Fold Belt	Central African Fold Belt	Guéra Massif	granite	U-Pb	556 ± 7	zircon	LA-ICP-MS	crystallization age	POST-OROGENIC		99
342	19.0067	11.4783		Chad	Central African Fold Belt	Central African Fold Belt	Guéra Massif	granite	U-Pb	589 ± 6	zircon	LA-ICP-MS	crystallization age	ARC		99
343	19.6767	12.2067		Chad	Central African Fold Belt	Central African Fold Belt	Guéra Massif	granite	U-Pb	561 ± 6	zircon	LA-ICP-MS	crystallization age	POST-OROGENIC		99
344	19.5317	11.9083		Chad	Central African Fold Belt	Central African Fold Belt	Guéra Massif	granite	U-Pb	591 ± 10	zircon	LA-ICP-MS	crystallization age	ARC		99
345	19.5183	11.9083		Chad	Central African Fold Belt	Central African Fold Belt	Guéra Massif	granite	U-Pb	550 ± 11	zircon	LA-ICP-MS	crystallization age	POST-OROGENIC		99
346	18.8483	12.1983		Chad	Central African Fold Belt	Central African Fold Belt	Guéra Massif	rhyolite	U-Pb	568 ± 6	zircon	LA-ICP-MS	crystallization age	POST-OROGENIC		99
347	16.3183	13.7267		Chad	Central African Fold Belt	Central African Fold Belt	Ngoura	granite	U-Pb	551 ± 6	zircon	LA-ICP-MS	crystallization age	POST-OROGENIC		99
348	16.0200	12.7800		Chad	Central African Fold Belt	Central African Fold Belt	Moyto	granite	U-Pb	545 ± 6	zircon	LA-ICP-MS	crystallization age	POST-OROGENIC		99
349	16.3520	9.0950		Chad	Central African Fold Belt	Central African Fold Belt	Doba basin	diorite	U-Pb	572.59 ± 0.33	zircon	CA-ID TIMS	crystallization age	POST-OROGENIC		99
350	32.9400	16.2883	cop	Sudan	East Saharan Croton	Nubian Shield	Sabaloka granulites	granulites of igneous derivation	Rb-Sr	720± 72	WR	isochrone	crystallization age	ARC		100
351	32.9400	16.2883	cop	Sudan	East Saharan Croton	Nubian Shield	Sabaloka granulites	granulites of igneous derivation	U-Pb	719 ± 81	zircon	SHRIMP	crystallization age	ARC		100
352	5.4558	22.5358	nc	Algeria	Saharan metacraton	Central Hoggar	Tin Amzi complex	granodiorite	U-Pb	578 ± 6	sphene+monazite	concordant age	cooling age	?		101
353	5.3931	22.4350	nc	Algeria	Saharan metacraton	Central Hoggar	Tin Amzi complex	granodiorite	U-Pb	612 +50/-20	zircon	upper intercept	crystallization age	SYN/LATE-OROGENIC		101
354	5.4736	22.6478	nc	Algeria	Saharan metacraton	Central Hoggar	Anfeg	granite	U-Pb	615 ± 5	zircon	upper intercept	crystallization age	SYN/LATE-OROGENIC		101
355	34.3500	24.4000	cop	Egypt	Eastern Desert	Meatiq and Hafafit domes	Hafafit complex	granite gneiss	Rb-Sr	609 ± 17	WR	isochrone	cooling (formation) age	ARC		102
356	-7.5410	30.8239		Morocco	Anti-Atlas region	Sirwa inlier	Tasriwine ophiolite complex	amphibolite	Sm-Nd	647.2 ± 1.7	WR- bulk-garnet	isochrone	High grade metamorphism	METAMORPHISM		103
357	-4.9206	31.4158	fm	Morocco	Eastern Anti-Atlas	Ougnat	Bou Madine rhyolitic dome	rhyolite	U-Pb	552±5	zircon	SIMS	crystallization age	RIFTING		104

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
358	-5.7281	31.3475	fm	Morocco	Eastern Anti-Atlas	Saghro–Imiter	Tachkakacht rhyolitic dyke	rhyolite	U-Pb	543±9	zircon	SIMS	crystallization age	RIFTING		104
359	-6.8164	30.5253	fm	Morocco	Central Anti-Atlas	Bou Azzer	Aghbar trachytic sill	trachyte	U-Pb	531±5	zircon	SIMS	crystallization age	RIFTING		104
360	-6.6703	30.4786	nc	Morocco	Central Anti-Atlas	Bou Azzer	Jbel Boho	syenite	U-Pb	534 +10	zircon	IDTIMS	crystallization age	RIFTING		105
361	-5.7281	31.3475	nc	Morocco	Central Anti-Atlas	Bou Azzer	Bou Azzer	volcanic ?	U-Pb	522.4 ±2	zircon	IDTIMS	crystallization age	RIFTING		106
362	-5.7281	31.3475	nc	Morocco	Central Anti-Atlas	Bou Azzer	Bou Azzer	ash layer	U-Pb	517 ± 1.5	zircon	IDTIMS	crystallization age	RIFTING		106
363	-8.0036	29.8944	fm	Morocco	Western Anti-Atlas	Assif Tifarchat	Ouarzazate Series	ignimbrite	U-Pb	565±7	zircon	SHRIMP	extrusion age	POST-OROGENIC		107
364	-7.5822	30.8311		Morocco	Western Anti-Atlas	Siroua inlier	Tasriwine ophiolite	plagiogranites	U-Pb	761.1 +1.9/−1.6	zircon	LA-ICP-MS	crystallization age	OP		108
365	-7.5822	30.8311		Morocco	Western Anti-Atlas	Siroua inlier	Tasriwine ophiolite	plagiogranites	U-Pb	762 + 1/−2	zircon	LA-ICP-MS	crystallization age	OP		108
366	-7.1022	30.9550	nc	Morocco	Western Anti-Atlas	Siroua inlier	Jebel Bachkoun	rhyolite	U-Pb	580 ± 12	zircon	IDTIMS	extrusion age	FAULTING		109
367	-7.1364	30.9661	nc	Morocco	Western Anti-Atlas	Siroua inlier	Tiouine	ignimbrite	U-Pb	563 ± 10	zircon	IDTIMS	extrusion age	FAULTING		109
368	-7.1364	30.9661	nc	Morocco	Western Anti-Atlas	Siroua inlier	Tiouine	ignimbrite	U-Pb	586 ± 20	zircon	IDTIMS	extrusion age	FAULTING		109
369	-6.0657	30.9822		Morocco	Western Anti-Atlas	Jebel Saghro inlier	Jebel Amgroud	rhyolite flow	U-Pb	556 ± 4	zircon	SHRIMP	extrusion age	FAULTING		110
370	-6.3481	30.8063		Morocco	Western Anti-Atlas	Jebel Saghro inlier	Oued Alqantrat	rhyolite flow	U-Pb	558 ± 4	zircon	SHRIMP	extrusion age	FAULTING		110
371	-6.3427	30.8118		Morocco	Western Anti-Atlas	Jebel Saghro inlier	Lower Ouarzazate Supergroup	rhyolite flow	U-Pb	571 ± 5	zircon	SHRIMP	extrusion age	FAULTING		110
372	-6.6253	30.9500		Morocco	Western Anti-Atlas	Jebel Saghro inlier	Lower Ouarzazate Supergroup	rhyodacitic tuff	U-Pb	571 ± 5	zircon	SHRIMP	extrusion age	FAULTING		110
373	-6.6001	30.9334		Morocco	Western Anti-Atlas	Jebel Saghro inlier	Oued Dar'a caldera	rhyolitic tuff	U-Pb	574 ± 7	zircon	SHRIMP	extrusion age	FAULTING		110
374	-6.3020	30.9336		Morocco	Western Anti-Atlas	Jebel Saghro inlier	Timijt swarm	rhyolitic dike	U-Pb	562 ± 5	zircon	SHRIMP	extrusion age	FAULTING		110
375	-6.1665	31.0256		Morocco	Western Anti-Atlas	Jebel Saghro inlier	Isk-n-Alla	granite	U-Pb	559 ± 5	zircon	SHRIMP	intrusion age	POST-OROGENIC		110
376	-6.1265	31.0198		Morocco	Western Anti-Atlas	Jebel Saghro inlier	Tagmout	gabbro	U-Pb	556 ± 5	zircon	SHRIMP	intrusion age	POST-OROGENIC		110
377	-6.2865	30.9237		Morocco	Western Anti-Atlas	Jebel Saghro inlier	Bouskour–Sidi Flah swarm	rhyolitic dike	U-Pb	563 ± 7	zircon	SHRIMP	extrusion age	POST-OROGENIC		110
378	-6.2745	30.9109		Morocco	Western Anti-Atlas	Jebel Saghro inlier	Bouskour	granite	U-Pb	570 ± 5	zircon	SHRIMP	intrusion age	POST-OROGENIC		110
379	-6.1332	31.1601		Morocco	Western Anti-Atlas	Jebel Saghro inlier	Wizergane	granodiorite	U-Pb	576 ± 5	zircon	SHRIMP	intrusion age	POST-OROGENIC		110

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
380	-6.3921	30.8479		Morocco	Western Anti-Atlas	Jebel Saghro inlier	Assif Tagmout	pink microgranite	U-Pb	574 ± 9	zircon	SHRIMP	intrusion age	POST-OROGENIC		110
381	-6.3582	30.8074		Morocco	Western Anti-Atlas	Jebel Saghro inlier	Zouzmitane	microgranite	U-Pb	588 ± 7	zircon	SHRIMP	intrusion age	POST-OROGENIC		110
382	-6.7274	30.5296		Morocco	Western Anti-Atlas	Bou Azzer–El Graara inlier	Tafrawt (El Graara sub-inlier)	quartz diorite	U-Pb	645 ± 7	zircon	SHRIMP	intrusion age	OROGENIC		110
383	-6.6626	30.5156		Morocco	Western Anti-Atlas	Bou Azzer–El Graara inlier	Tamellalet (El Graara sub-inlier)	quartz diorite	U-Pb	646 ± 8	zircon	SHRIMP	intrusion age	OROGENIC		110
384	-6.7269	30.5007		Morocco	Western Anti-Atlas	Bou Azzer–El Graara inlier	Tazigzaout sub-inlier	granodiorite	U-Pb	650 ± 10	zircon	SHRIMP	intrusion age	OROGENIC		110
385	34.9672	29.7750	fm	Israel	Arabian-Nubian Shield	Timna igneous complex	Mounth Timna	high-Ti dolerite	Ar-Ar	531.7 ± 4.6	WR	convetional	formation	POST-OROGENIC		111
386	34.9728	29.7744	fm	Israel	Arabian-Nubian Shield	Timna igneous complex	Mounth Timna	dolerite	K-Ar	546.31 ± 10.10	WR	convetional	formation	POST-OROGENIC		111
387	34.9567	29.6622	fm	Israel	Arabian-Nubian Shield	Timna igneous complex	Mounth Amram	dolerite	K-Ar	508.93 ± 9.15	WR	stepwise	formation	POST-OROGENIC		111
388	34.9158	29.5831	fm	Israel	Arabian-Nubian Shield	Elat complex	Elat composite dikes	rhyolite (qtz-porphyry)	U-Pb	590 ± 9	zircon	?	formation	RIFTING	112	113
389	34.8983	29.5558	cop	Israel	Arabian-Nubian Shield	Elat complex	Elat composite dikes	dacite	U-Pb	591 ± 13	zircon	SIMS	intrusion age	RIFTING	112	113
390	34.8983	29.5558	cop	Israel	Arabian-Nubian Shield	Elat complex	Elat composite dikes	rhyolite	U-Pb	591 ± 13	zircon	SIMS	intrusion age	RIFTING	112	113
391	34.9769	29.7803	fm	Israel	Arabian-Nubian Shield	Timna igneous complex	Timna igneous complex	quartz monzodiorite	Pb-Pb	599.3 ± 2.0	zircon	evaporation	intrusion age	RIFTING		114
392	34.9749	29.7813	fm	Israel	Arabian-Nubian Shield	Timna igneous complex	Timna igneous complex	monzodiorite	U-Pb	602.0 ± 5.2	zircon	SIMS	intrusion age	RIFTING		115
393	34.9749	29.7813	fm	Israel	Arabian-Nubian Shield	Timna igneous complex	Timna igneous complex	monzodiorite	Pb-Pb	610 ± 8	zircon	evaporation	intrusion age	RIFTING		116
394	34.9708	29.7689	fm	Israel	Arabian-Nubian Shield	Timna igneous complex	Timna igneous complex	alkali feldspar granite	U-Pb	606 ± 3	zircon	SIMS	intrusion age	RIFTING		115
395	34.9708	29.7689	fm	Israel	Arabian-Nubian Shield	Timna igneous complex	Timna igneous complex	alkali feldspar granite	Pb-Pb	609 ± 10	zircon	evaporation	intrusion age	RIFTING		116
396	34.9797	29.7753	fm	Israel	Arabian-Nubian Shield	Timna igneous complex	Timna igneous complex	olivine norite	Pb-Pb	611 ± 10	zircon	evaporation	intrusion age	RIFTING		116
397	34.8953	29.5531	fm	Israel	Arabian-Nubian Shield	Elat complex	Yehoshafat granite	syenogranite	U-Pb	605 ± 4	zircon	SIMS	intrusion age	RIFTING		115
398	34.9450	29.6581	fm	Israel	Arabian-Nubian Shield	Elat complex	Amram alcali volcanics	alkali rhyolite	U-Pb	606 ± 3	zircon	SIMS	intrusion age	RIFTING	115	113

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
399	34.9272	29.5219	fm	Israel	Arabian-Nubian Shield	Elat complex	Elat Shlomo pluton	microdiorite	U-Pb	614 ± 6	zircon	SIMS	intrusion age	RIFTING	115	113
400	34.9042	29.5856	fm	Israel	Arabian-Nubian Shield	Elat complex	Rehavam pluton	bt-ms monzogranite	U-Pb	630.0 ± 4.9	zircon	SIMS	intrusion age	POST-OROGENIC	115	113
401	34.9419	29.5881	fm	Israel	Arabian-Nubian Shield	Elat complex	Elat granite	monzogranite	U-Pb	634 ± 4	zircon	MC-LA-ICP-MS	intrusion age	POST-OROGENIC		117
402	34.9744	29.7658	cop	Israel	Arabian-Nubian Shield	Timna igneous complex	Timna igneous complex	bt monzogranite	U-Pb	632 ± 7	zircon	SIMS	intrusion age	POST-OROGENIC		115
403	34.9878	29.7697	cop	Israel	Arabian-Nubian Shield	Timna igneous complex	Timna igneous complex	porphyry granite	Pb-Pb	625 ± 5	zircon	evaporation	intrusion age	LATE-OROGENIC		116
404	34.9264	29.5892	cop	Israel	Arabian-Nubian Shield	Elat complex	Elat complex	quartz diorite	U-Pb	634 ± 2	zircon	?	intrusion age	POST-OROGENIC		118
405	34.9400	29.5775	cop	Israel	Arabian-Nubian Shield	Elat complex	Shahmon metabasite pluton	quartz-diorite	U-Pb	672 ± 4	zircon	MC-LA-ICP-MS	intrusion age	POST-OROGENIC		117
406	34.9031	29.5786	cop	Israel	Arabian-Nubian Shield	Elat complex	Roded quartz dioritic gneiss pluton	hbl-bt quartz dioritic to tonalitic gneiss	U-Pb	742 ± 6	zircon	?	intrusion age	ARC	78	Be'eri-Shlevin pers. Comm.
407	34.9799	29.6890		Israel	Arabian-Nubian Shield	Elat complex	Shahmon metabasite pluton	high alumina hb gabbro	Pb-Pb	640 ± 10	zircon	evaporation	intrusion age	POST-OROGENIC	84	119
408	34.9608	29.6811		Israel	Arabian-Nubian Shield	Elat complex	Elat gneiss pluton	granitic gneiss	Pb-Pb	744 ± 5	zircon	evaporation	intrusion age	ARC	84	119
409	34.8261	29.4336		Israel	Arabian-Nubian Shield	Taba region	Fiord pluton	bt tonalitic gneiss	Pb-Pb	765 ± 6	zircon	evaporation	intrusion age	ARC	84	119
410	34.9032	29.4936		Israel	Arabian-Nubian Shield	Taba region	Taba pluton	bt tonalitic gneiss	Pb-Pb	779 ± 8	zircon	evaporation	intrusion age	ARC	84	119
411	34.9799	29.6890		Israel	Arabian-Nubian Shield	Elat complex	Shahmon	metadiorite	Pb-Pb	643 ± 9	zircon	evaporation	intrusion age	POST-OROGENIC		119
412	34.9799	29.6890		Israel	Arabian-Nubian Shield	Elat complex	Shahmon	metadiorite	Pb-Pb	641 ± 6	zircon	evaporation	intrusion age	POST-OROGENIC		119
413	34.8247	29.4606		Egypt	Arabian-Nubian Shield	Taba region	Taba	gniess	Pb-Pb	782 ± 9	zircon	evaporation	intrusion age	ARC		119
414	34.8261	29.4336		Egypt	Arabian-Nubian Shield	Taba region	Fjord	gneiss	Pb-Pb	767 ± 5	zircon	evaporation	intrusion age	ARC		119
415	37.1500	18.7500		Sudan	Arabian-Nubian Shield	Red Sea Hills	Erkowit	granite	Pb-Pb	856 ± 10	zircon	evaporation	intrusion age	ARC		120
416	37.1780	18.8013		Sudan	Arabian-Nubian Shield	Red Sea Hills	Khor Dehand	granodiorite	Pb-Pb	871 ± 10	zircon	evaporation	intrusion age	ARC		120
417	37.8833	17.8833		Sudan	Arabian-Nubian Shield	Red Sea Hills	Khor Sebat	felsic metavolcanic	Pb-Pb	840 ± 16	zircon	evaporation	intrusion age	ARC		120

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418	38.2500	18.0333		Sudan	Arabian-Nubian Shield	Red Sea Hills	Jabal Dirtet	rhyolite	Pb-Pb	854 ± 18	zircon	evaporation	intrusion age	ARC		120
419	38.1300	18.1390		Sudan	Arabian-Nubian Shield	Red Sea Hills	Jabal Debir Anka	granitoid	Pb-Pb	827 ± 33	zircon	evaporation	intrusion age	ARC		120
420	37.8083	18.0363		Sudan	Arabian-Nubian Shield	Red Sea Hills	Jabal Um Achabe	granite	Pb-Pb	652 ± 14	zircon	evaporation	intrusion age	POST-OROGENIC		120
421	36.9350	18.9320		Sudan	Arabian-Nubian Shield	Nafirdeib Series	Aquaba	rhyolites	Pb-Pb	887±20	zircon	evaporation	intrusion age	ARC		121
422	36.9350	18.9320		Sudan	Arabian-Nubian Shield	Nafirdeib Series	Aquaba	rhyolites	Pb-Pb	868±10	zircon	evaporation	intrusion age	ARC		121
423	37.1536	19.0633		Sudan	Arabian-Nubian Shield	Nafirdeib Series	Suakin	granite	U-Pb	854±9	zircon	IDTIMS	intrusion age	ARC		121
424	32.8598	18.5357		Sudan	Arabian-Nubian Shield	Bayuda Desert and Sabaloka	El Melagi	gneiss	U-Pb	917 ± 14	zircon	SHRIMP	intrusion age	OROGENIC		122
425	33.5125	19.0605		Sudan	Arabian-Nubian Shield	Bayuda Desert and Sabaloka	Dam Et Tor	gneiss	U-Pb	858 ± 7	zircon	SHRIMP	intrusion age	ARC		122
426	33.4074	18.9459		Sudan	Arabian-Nubian Shield	Bayuda Desert and Sabaloka	Absol	granodiorite	U-Pb	900 ± 9	zircon	SHRIMP	intrusion age	POST-OROGENIC		122
427	33.2238	18.7094		Sudan	Arabian-Nubian Shield	Bayuda Desert and Sabaloka	An Ithnein	granite	U-Pb	597 ± 4	zircon	SHRIMP	intrusion age	POST-OROGENIC		122
428	32.8173	16.3114		Sudan	Arabian-Nubian Shield	Bayuda Desert and Sabaloka	Banjedid	granite	U-Pb	605 ± 4	zircon	SHRIMP	intrusion age	POST-OROGENIC		122
429	32.7388	16.3383		Sudan	Arabian-Nubian Shield	Bayuda Desert and Sabaloka	Babdos	shoshonitic granite	U-Pb	591 ± 5	zircon	SHRIMP	intrusion age	POST-OROGENIC		122
430	33.1667	27.3333		Egypt	Arabian-Nubian Shield	Eastern Desert	Abu Harba	granite	U-Pb	595.3 ± 3.3	zircon	SHRIMP	intrusion age	POST-OROGENIC		123
431	33.3333	27.1667		Egypt	Arabian-Nubian Shield	Eastern Desert	Qattar	granite	U-Pb	604.8 ± 3.3	zircon	SHRIMP	intrusion age	POST-OROGENIC		123
432	33.5000	26.5000		Egypt	Arabian-Nubian Shield	Eastern Desert	Qena–Safaga	granite	U-Pb	652.5 ± 2.6	zircon	SHRIMP	intrusion age	ARC		123
433	33.4333	26.3333		Egypt	Arabian-Nubian Shield	Eastern Desert	Al Missikat	granite	U-Pb	596.5 ± 7	zircon	SHRIMP	intrusion age	POST-OROGENIC		123
434	33.8333	22.6333		Egypt	Arabian-Nubian Shield	Eastern Desert	Um Ara	granite	U-Pb	603 ± 14	zircon	SHRIMP	intrusion age	POST-OROGENIC		123
435	35.6667	22.6083		Egypt	Arabian-Nubian Shield	Eastern Desert	Jabal Hamrdom	granite	U-Pb	585 ± 41	zircon	SHRIMP	intrusion age	POST-OROGENIC	84	124
436	33.2933	27.2369		Egypt	Arabian-Nubian Shield	Dokhan Volcanics, Gebel Dokhan	Wadi Abu Maamel Dokhan	andesite?	U-Pb	602 ± 9	zircon	SHRIMP	intrusion age	POST-OROGENIC	84	125
437	33.2744	27.2358		Egypt	Arabian-Nubian Shield	Dokhan Volcanics, Gebel Dokhan	Wadi Abu Maamel	andesite?	U-Pb	593 ± 13	zircon	SHRIMP	intrusion age	POST-OROGENIC	84	125

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
438	39.4892	22.4710		Saudi Arabia	Arabian-Nubian Shield	Bi'r Umq suture zone	Qudayd	metatonalite	U-Pb	782 ± 7	zircon	SHRIMP	intrusion age	SYN-OROGENIC		126
439	39.5598	22.4158		Saudi Arabia	Arabian-Nubian Shield	Bi'r Umq suture zone	Samran group	rhyolite	U-Pb	777 ± 28	zircon	SHRIMP	intrusion age	PRE-OROGENIC		126
440	39.7374	22.3766		Saudi Arabia	Arabian-Nubian Shield	Bi'r Umq suture zone	Samran group	dacite	U-Pb	753 ± 6	zircon	SHRIMP	intrusion age	PRE-OROGENIC		126
441	39.7615	22.3183		Saudi Arabia	Arabian-Nubian Shield	Bi'r Umq suture zone	Samran group	andesite	U-Pb	752 ± 4	zircon	SHRIMP	intrusion age	PRE-OROGENIC		126
442	39.7939	22.2775		Saudi Arabia	Arabian-Nubian Shield	Bi'r Umq suture zone	Nakhu	granite	U-Pb	699 ± 7	zircon	SHRIMP	intrusion age	POST-OROGENIC		126
443	39.8166	22.2548		Saudi Arabia	Arabian-Nubian Shield	Bi'r Umq suture zone	kamil	diorite	U-Pb	802 ± 5	zircon	SHRIMP	intrusion age	PRE-OROGENIC		126
444	39.5902	22.5517		Saudi Arabia	Arabian-Nubian Shield	Bi'r Umq suture zone	Qudayd	metatonalite	U-Pb	751 ± 5	zircon	SHRIMP	intrusion age	SYN-OROGENIC		126
445	39.3950	22.6405		Saudi Arabia	Arabian-Nubian Shield	Bi'r Umq suture zone	Thrawah	ophiolite (gabbro)	U-Pb	777 ± 17	zircon	SHRIMP	intrusion age	PRE-OROGENIC		126
446	40.6581	22.4232		Saudi Arabia	Arabian-Nubian Shield	Bi'r Umq suture zone	Mahd group	rhyolite	U-Pb	777 ± 5	zircon	SHRIMP	intrusion age	PRE-OROGENIC		126
447	40.6600	22.4335		Saudi Arabia	Arabian-Nubian Shield	Bi'r Umq suture zone	Ramram	granodiorite	U-Pb	769 ± 6	zircon	SHRIMP	intrusion age	PRE-OROGENIC		126
448	40.6661	23.4578		Saudi Arabia	Arabian-Nubian Shield	Bi'r Umq suture zone	Ramram	granite	U-Pb	749 ± 10	zircon	SHRIMP	intrusion age	PRE-OROGENIC		126
449	40.8162	23.4154		Saudi Arabia	Arabian-Nubian Shield	Bi'r Umq suture zone	Dhukhr	tonalite	U-Pb	803 ± 17	zircon	SHRIMP	intrusion age	PRE-OROGENIC		126
450	40.9256	23.4770		Saudi Arabia	Arabian-Nubian Shield	Bi'r Umq suture zone	Bari	granite	U-Pb	776 ± 6	zircon	SHRIMP	intrusion age	PRE-OROGENIC		126
451	40.0586	23.5031		Saudi Arabia	Arabian-Nubian Shield	Bi'r Umq suture zone	Hufayriyah	tonalite	U-Pb	785 ± 6	zircon	SHRIMP	intrusion age	PRE-OROGENIC		126
452	39.8883	22.4122		Saudi Arabia	Arabian-Nubian Shield	Bi'r Umq suture zone	Kamil	diorite	U-Pb	772 ± 6	zircon	SHRIMP	intrusion age	PRE-OROGENIC		126
453	39.3660	22.7056		Saudi Arabia	Arabian-Nubian Shield	Bi'r Umq suture zone	Bi'rak	microgabbro	U-Pb	854 ± 15	zircon	SHRIMP	intrusion age	PRE-OROGENIC		126
454	39.3620	22.7050		Saudi Arabia	Arabian-Nubian Shield	Bi'r Umq suture zone	Bi'rak	microgabbro	U-Pb	812 ± 23	zircon	SHRIMP	intrusion age	PRE-OROGENIC		126
455	39.3243	22.7768		Saudi Arabia	Arabian-Nubian Shield	Bi'r Umq suture zone	Hanak	granite	U-Pb	596 ± 10	zircon	SHRIMP	intrusion age	POST-OROGENIC		126
456	41.3943	23.4450		Saudi Arabia	Arabian-Nubian Shield	Bi'r Umq suture zone	Dhukhr	diorite	U-Pb	813 ± 10	zircon	SHRIMP	intrusion age	PRE-OROGENIC		126
457	36.5322	26.3724		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Imdan complex	granitoid	U-Pb	676 ± 6	zircon	SHRIMP	intrusion age	ARC	84	127
458	37.0033	26.1030		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Ash Shab granite	granite	U-Pb	609 ± 4	zircon	SHRIMP	intrusion age	OROGENIC	84	127

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
459	37.2260	26.0177		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Unassigned	lamprophyre dike	U-Pb	573 ± 6	zircon	SHRIMP	intrusion age	OROGENIC	84	127
460	37.2596	26.0155		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Unassigned	foliated granite	U-Pb	575 ± 10	zircon	SHRIMP	intrusion age	OROGENIC	84	127
461	37.1608	26.4577		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Unassigned	granite	U-Pb	626 ± 4	zircon	SHRIMP	intrusion age	OROGENIC	84	127
462	39.8271	21.4253		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Makkah	batholith gabbro	U-Pb	859 ± 1	zircon	SHRIMP	intrusion age	ARC	84	127
463	37.1510	26.1352		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Habd	granite	U-Pb	609 ± 4	zircon	SHRIMP	intrusion age	OROGENIC	84	127
464	44.1997	22.6641		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Kirsh	granite gneiss	U-Pb	647 ± 8	zircon	SHRIMP	intrusion age	ARC	84	127
465	40.1203	24.0056		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Urayfi fm.	rhyolite	U-Pb	747 ± 2	zircon	SHRIMP	intrusion age	ARC	84	127
466	41.1287	27.0106		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Hadn formation	felsic volcanic	U-Pb	614 ± 6	zircon	SHRIMP	intrusion age	OROGENIC	84	127
467	43.3300	24.1021		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Jurdhawiyah	andesite-dacite	U-Pb	594 ± 16	zircon	SHRIMP	intrusion age	OROGENIC	84	127
468	43.2771	23.2449		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Sub-Murdama	andesite	U-Pb	623 ± 6	zircon	SHRIMP	intrusion age	OROGENIC	84	127
469	44.1997	22.6641		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Kirsh gneiss	pegmatite	U-Pb	637 ± 2	zircon	SHRIMP	intrusion age	ARC	84	127
470	43.3834	24.6816		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Habariyah	monzogranite gneiss	U-Pb	573 ± 8	zircon	SHRIMP	intrusion age	OROGENIC	84	127
471	44.5699	23.2668		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Sabah	granite	U-Pb	571 ± 9	zircon	SHRIMP	intrusion age	OROGENIC	84	127
472	44.5696	23.2668		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Sabah	granite	U-Pb	579 ± 3	zircon	SHRIMP	intrusion age	OROGENIC	84	127
473	44.5232	23.3177		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Najirah	granite	U-Pb	576 ± 6	zircon	SHRIMP	intrusion age	OROGENIC	84	127
474	44.7149	23.5613		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Kurs	granite	U-Pb	565 ± 2	zircon	SHRIMP	intrusion age	OROGENIC	84	127
475	44.6593	23.9765		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Unnamed	granite	U-Pb	575 ± 6	zircon	SHRIMP	intrusion age	OROGENIC	84	127
476	38.0144	25.2611		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Fashghah fm.	Rhyolite	U-Pb	708 ± 4	zircon	SHRIMP	intrusion age	ARC	84	127
477	42.0810	24.9166		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Ablahn fm.	felsic volcanic	U-Pb	630 ± 7	zircon	SHRIMP	intrusion age	OROGENIC	84	127
478	44.5880	23.8220		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Unnamed	granite	U-Pb	575 ± 6	zircon	SHRIMP	intrusion age	OROGENIC	84	127
479	37.9581	25.4083		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Fara	trondhjemite/granodiorite	U-Pb	713 ± 9	zircon	SHRIMP	intrusion age	ARC	84	127

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
480	38.6156	25.2086		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Siqam fm.	rhyolite	U-Pb	697 ± 7	zircon	SHRIMP	intrusion age	ARC	84	127, 128
481	40.1264	24.6764		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Urayfi fm.	rhyolite	U-Pb	736 ± 5	zircon	SHRIMP	intrusion age	ARC	84	127, 128
482	40.3745	25.0508		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	An Nakhli	gneiss/granite	U-Pb	731 ± 8	zircon	SHRIMP	intrusion age	ARC	84	127, 128
483	41.3614	27.0058		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Hadn intrusion	tonalite	U-Pb	683 ± 10	zircon	SHRIMP	intrusion age	ARC	84	127, 128
484	37.5474	25.6864		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Hamadat	gneiss/granodiorite	U-Pb	670 ± 10	zircon	SHRIMP	intrusion age	ARC	84	127, 128
485	38.0144	25.2611		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Fashghah fm.	rhyolite	U-Pb	711 ± 10	zircon	SHRIMP	intrusion age	ARC	84	127, 128
486	43.3607	24.1466		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Jurdhawiyah	andesite-dacite	U-Pb	612 ± 4	zircon	SHRIMP	intrusion age	OROGENIC	84	127, 128
487	44.3313	22.5661		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Sub-Murdama	rhyolite	U-Pb	620 ± 4	zircon	SHRIMP	intrusion age	OROGENIC	84	127, 128
488	44.2757	22.5844		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Sub-Mudama	rhyolite	U-Pb	607 ± 3	zircon	SHRIMP	intrusion age	OROGENIC	84	127, 128
489	43.1344	23.6451		Saudi Arabia	Arabian-Nubian Shield	Arabian-Nubian Shield	Murdama dike	rhyolite	U-Pb	631 ± 4	zircon	SHRIMP	intrusion age	OROGENIC	84	127, 128
490	45.0088	23.9752		Saudi Arabia	Arabian-Nubian Shield	Ar Rayn terrane	Jabal al Ashqar	granodiorite	U-Pb	632 ± 5	zircon	SHRIMP	intrusion age	ARC		129
491	45.1722	24.0077		Saudi Arabia	Arabian-Nubian Shield	Ar Rayn terrane	Jabal umm Sharzah	trondhjemite	U-Pb	689 ± 10	zircon	SHRIMP	intrusion age	ARC		129
492	45.4896	22.9994		Saudi Arabia	Arabian-Nubian Shield	Ar Rayn terrane	SE of Jabal Ruga'an	granite	U-Pb	617 ± 5	zircon	SHRIMP	intrusion age	ARC		129
493	45.0686	23.8688		Saudi Arabia	Arabian-Nubian Shield	Ar Rayn terrane	Jabal ar Ramadiyah	trondhjemite	U-Pb	616 ± 7	zircon	SHRIMP	intrusion age	ARC		129
494	45.4620	23.2440		Saudi Arabia	Arabian-Nubian Shield	Ar Rayn terrane	N of Wadi Ghurrah	granite	U-Pb	583 ± 8	zircon	SHRIMP	intrusion age	OROGENIC		129
495	45.5419	23.5696		Saudi Arabia	Arabian-Nubian Shield	Ar Rayn terrane	Bitran pluton	alkali granite	U-Pb	581 ± 6	zircon	SHRIMP	intrusion age	OROGENIC		129
496	43.2658	22.3034		Saudi Arabia	Arabian-Nubian Shield	Ar Rayn terrane	Siham gp	rhyodacite porphyry	U-Pb	685 ± 3	zircon	SHRIMP	intrusion age	ARC		129
497	43.2658	22.3034		Saudi Arabia	Arabian-Nubian Shield	Ar Rayn terrane	Siham gp	granodiorite	U-Pb	704 ± 8	zircon	SHRIMP	intrusion age	ARC		129
498	43.2658	22.3034		Saudi Arabia	Arabian-Nubian Shield	Ar Rayn terrane	Siham gp	granodiorite	U-Pb	710 ± 7	zircon	SHRIMP	intrusion age	ARC		129
499	43.2658	22.3034		Saudi Arabia	Arabian-Nubian Shield	Ar Rayn terrane	Post-Siham	granite	U-Pb	659 ± 7	zircon	SHRIMP	intrusion age	OROGENIC		129
500	43.2658	22.3034		Saudi Arabia	Arabian-Nubian Shield	Ar Rayn terrane	Post-Siham	quartz porphyry	U-Pb	646 ± 11	zircon	SHRIMP	intrusion age	OROGENIC		129

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
501	46.8600	14.0500		Yemen	Arabian-Nubian Shield	Al-Mahfid terrane	Al-Mahfid terrane	foliated granitic-gneiss	U-Pb	868 ± 22	zircon	SHRIMP	crystallization age	ARC		130
502	45.3450	14.2920		Yemen	Arabian-Nubian Shield	Abas terrane	Abas terrane	granitic orthogneiss	U-Pb	765 ± 16	zircon	SHRIMP	crystallization age	ARC		130
503	46.9100	14.0400		Yemen	Arabian-Nubian Shield	Al-Mahfid terrane	Al-Mahfid terrane	granite gneiss	U-Pb	764 ± 7	zircon	SHRIMP	crystallization age	ARC		130
504	46.9100	14.0500		Yemen	Arabian-Nubian Shield	Al-Mahfid terrane	Al-Mahfid terrane	granite gneiss	U-Pb	759 ± 9	zircon	SHRIMP	crystallization age	ARC		130
505	45.0300	14.3500		Yemen	Arabian-Nubian Shield	Abas terrane	Abas terrane	foliated grey gneiss	U-Pb	754 ± 13	zircon	SHRIMP	crystallization age	ARC		130
506	45.7900	13.8750		Yemen	Arabian-Nubian Shield	Al-Bayda arc	Al-Bayda arc	basaltic andesite dyke	Ar-Ar	823 ± 13	hornblende	plateau age	crystallization age			130
507	45.8700	13.9500		Yemen	Arabian-Nubian Shield	Al-Bayda arc	Al-Bayda arc	alkali granite	Ar-Ar	614 ± 11	hornblende	plateau age	crystallization age	INTRA-PLATE		130
508	45.7650	13.8700		Yemen	Arabian-Nubian Shield	Al-Bayda arc	Al-Bayda arc	host granitoid	K-Ar	740 ± 22	biotite		crystallization age	POST-OROGENIC		130
509	32.9018	24.0501		Egypt	Arabian-Nubian Shield	Aswan region	Monumental	granite	U-Pb	606 ± 2	zircon	ID-TIMS	crystallization age	POST-OROGENIC		131
510	32.9016	24.0515		Egypt	Arabian-Nubian Shield	Aswan region	Aswan	tonalite	U-Pb	605.5 ± 1.4	zircon	ID-TIMS	crystallization age	POST-OROGENIC		131
511	32.9137	24.0493		Egypt	Arabian-Nubian Shield	Aswan region	Aswan	tonalitic gneiss	U-Pb	638 ± 12	zircon	ID-TIMS	crystallization age	ARC		131
512	32.9137	24.0493		Egypt	Arabian-Nubian Shield	Aswan region	Aswan	tonalitic gneiss	U-Pb	622 ± 11	zircon	LA-ICP-MS	crystallization age	ARC		131
513	32.9171	24.0479		Egypt	Arabian-Nubian Shield	Aswan region	High-Dam	granite	U-Pb	595 ± 11	zircon	LA-ICP-MS	crystallization age	POST-OROGENIC		131
514	32.9018	24.0501		Egypt	Arabian-Nubian Shield	Aswan region	Monumental	granite	U-Pb	604 ± 15	zircon	LA-ICP-MS	crystallization age	POST-OROGENIC		131
515	34.3263	28.2114		Egypt	Arabian-Nubian Shield	Tarr carbonatite	Wadi Tarr albitite/Sinai	albitite	U-Pb	605 ± 13	zircon	SIMS	crystallization age	RIFTING		132
516	33.9907	28.5220		Egypt	Arabian-Nubian Shield	Katherine ring-complex	Moneiga	quartz-diorite	U-Pb	844 ± 4	zircon	SIMS	crystallization age	RIFTING		133
517	43.7500	9.9300		Somalia	Arabian-Nubian Shield	Somali basement	Mora complex	leucogranite	Pb-Pb	842 ± 4	zircon	evaporation	crystallization age	POST-OROGENIC		134
518	45.1200	10.1500		Somalia	Arabian-Nubian Shield	Somali basement	Gabbro-syenite belt	gabbro-syenite	Pb-Pb	814 ± 7	zircon	evaporation	crystallization age	POST-OROGENIC		134
519	45.1200	10.1500		Somalia	Arabian-Nubian Shield	Somali basement	Hudiso migmatite	migmatite	Pb-Pb	808 ± 6	zircon	evaporation	crystallization age	POST-OROGENIC		134
520	45.1200	10.1500		Somalia	Arabian-Nubian Shield	Somali basement	Gabbro-syenite belt	gabbro-syenite	Pb-Pb	778 ± 8	zircon	evaporation	crystallization age	POST-OROGENIC		134
521	45.0800	10.1700		Somalia	Arabian-Nubian Shield	Somali basement	Qabi Bahar complex	granodioritic gneiss	Pb-Pb	761 ± 4	zircon	evaporation	crystallization age	POST-OROGENIC		134

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
522	44.0800	9.9200		Somalia	Arabian-Nubian Shield	Somali basement	Mora complex	layered granitoid orthogneiss	Pb-Pb	718 ± 9	zircon	evaporation	crystallization age	POST-OROGENIC		134
523	35.8000	18.6700		Sudan	Arabian-Nubian Shield	Nakasib suture	Adaiamet	diorite	Pb-Pb	812 ± 10	zircon	evaporation	crystallization age	ARC		135
524	35.8000	18.6700		Sudan	Arabian-Nubian Shield	Nakasib suture	Adaiamet	diorite	Pb-Pb	810 ± 12	zircon	evaporation	crystallization age	ARC		135
525	35.8300	19.0500		Sudan	Arabian-Nubian Shield	Nakasib suture	Luggag pluton	granodiorite	Pb-Pb	762 ± 23	zircon	evaporation	crystallization age	LATE/POST-OROGENIC		135
526	36.0000	19.3000	cop	Sudan	Arabian-Nubian Shield	Nakasib suture	Wadi Agwampt	N-S-striking syenitic dykes	Rb-Sr	523 ± 18	WR	isochrone	crystallization age	INTRA-PLATE		135
527	35.8000	21.4300		Sudan	Arabian-Nubian Shield	Red sea Hill	Red sea Hill	granodiorite	Pb-Pb	762 ± 6	zircon	evaporation	crystallization age	ARC	84	136
528	34.4300	21.9000		Sudan	Arabian-Nubian Shield	Red sea Hill	Red sea Hill	basalt/rhyolite	Pb-Pb	733 ± 13	zircon	evaporation	crystallization age	ARC	84	136
529	35.3500	22.2100		Sudan	Arabian-Nubian Shield	Red sea Hill	Ligrg pluton	granite gneiss	Pb-Pb	844 ± 10	zircon	evaporation	crystallization age	ARC	84	136
530	35.2300	22.2600		Sudan	Arabian-Nubian Shield	Red sea Hill	Shinai pluton	quartz diorite	Pb-Pb	691 ± 5	zircon	evaporation	crystallization age	SYN-OROGENIC	136	137
531	38.4800	16.5300		Ethiopia	Arabian-Nubian Shield	ER Nakfa	Tsabra	granodiorite	Pb-Pb	838 ± 1.4	zircon	evaporation	crystallization age	ARC	84	138
532	38.5100	16.5000		Ethiopia	Arabian-Nubian Shield	ER Nakfa	Emba	granite	Pb-Pb	631 ± 0.7	zircon	evaporation	crystallization age	ARC	84	138
533	38.4800	16.5300		Ethiopia	Arabian-Nubian Shield	ER Nakfa	Wogret	granite	Pb-Pb	622 ± 1	zircon	evaporation	crystallization age	ARC	84	138
534	39.0500	15.4000		Ethiopia	Arabian-Nubian Shield	ER Asmara area	Nesafit	diorite	Pb-Pb	811 ± 0.2	zircon	evaporation	crystallization age	ARC	84	138
535	39.4000	5.0000		Ethiopia	Arabian-Nubian Shield	Awata	Awata	gneiss	Pb-Pb	884 ± 0.8	zircon	evaporation	crystallization age	ARC	84	139
536	39.0800	5.9200		Ethiopia	Arabian-Nubian Shield	Zembaba area	Zembaba area	granite	Pb-Pb	752 ± 0.6	zircon	evaporation	crystallization age	ARC	84	139
537	38.1700	4.8300		Ethiopia	Arabian-Nubian Shield	Yavello	Yavello	gneiss	Pb-Pb	716 ± 1.2	zircon	evaporation	crystallization age	ARC	84	139
538	39.0800	5.9200		Ethiopia	Arabian-Nubian Shield	Alghe	Alghe	gneiss	Pb-Pb	560 ± 0.9	zircon	evaporation	crystallization age		84	139
539	41.0900	9.1800		Ethiopia	Arabian-Nubian Shield	Hirna region	Hirna area gneiss	gneiss	Pb-Pb	844 ± 1.1	zircon	evaporation	crystallization age	ARC	84	139
540	41.0800	9.1800		Ethiopia	Arabian-Nubian Shield	Harrar	Harrar	biotite gneiss	Pb-Pb	649 ± 0.6	zircon	evaporation	crystallization age		84	139
541	41.0800	9.1800		Ethiopia	Arabian-Nubian Shield	Hirna region	Hirna area gneiss	gneiss	Pb-Pb	942 ± 9	zircon	evaporation	crystallization age	ARC	84	139

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542	-6.3600	30.4050	fm	Morocco	Anti-Atlas Orogen	Bou Azzer-El Graara inlier	Tichibanine Group	rhyolite	U-Pb	767 ±7	zircon	SHRIMP	crystallization age	ARC		140
543	-6.5020	30.4660	fm	Morocco	Anti-Atlas Orogen	Bou Azzer-El Graara inlier	Tichibanine Group	rhyolite	U-Pb	761 ±7	zircon	SHRIMP	crystallization age	ARC		140
544	-6.9490	30.5220	fm	Morocco	Anti-Atlas Orogen	Bou Azzer-El Graara inlier	Assif n'Bougmmane gneissic complex	orthogneiss	U-Pb	755 ±9	zircon	SHRIMP	crystallization age	ARC		140
545	-6.6160	30.4340	fm	Morocco	Anti-Atlas Orogen	Bou Azzer-El Graara inlier	Assif n'Bougmmane gneissic complex	orthogneiss	U-Pb	745 ±5	zircon	SHRIMP	crystallization age	ARC		140
546	-6.6610	30.4470	fm	Morocco	Anti-Atlas Orogen	Bou Azzer-El Graara inlier	Granitic intrusion	granite	U-Pb	702 ±5	zircon	SHRIMP	crystallization age	ARC		140
547	-6.8000	30.5140	fm	Morocco	Anti-Atlas Orogen	Bou Azzer-El Graara inlier	Granitic intrusion	granite	U-Pb	695 ±7	zircon	SHRIMP	crystallization age	ARC		140
548	-6.5930	30.4760	fm	Morocco	Anti-Atlas Orogen	Bou Azzer-El Graara inlier	Bou Azzer ophiolite	plagiogranite	U-Pb	658 ±8	zircon	SHRIMP	crystallization age	ARC		140
549	-6.9230	30.4920	fm	Morocco	Anti-Atlas Orogen	Bou Azzer-El Graara inlier	Tiddiline Group	rhyolitic welded tuff	U-Pb	606 ±4	zircon	SHRIMP	crystallization age	ARC		140
550	-6.6160	30.4350	fm	Morocco	Anti-Atlas Orogen	Bou Azzer-El Graara inlier	Tiddiline Group	trachyte	U-Pb	606 ±5	zircon	SHRIMP	crystallization age	ARC		140
551	-6.9190	30.4890	fm	Morocco	Anti-Atlas Orogen	Bou Azzer-El Graara inlier	Ouarzazate Group	rhyolitic welded tuff	U-Pb	567 ±5	zircon	SHRIMP	crystallization age	SYN-OROGENIC		140
552	-6.7650	30.6370	fm	Morocco	Anti-Atlas Orogen	Bou Azzer-El Graara inlier	Ouarzazate Group	rhyolitic welded tuff	U-Pb	566 ± 4	zircon	SHRIMP	crystallization age	SYN-OROGENIC		140
553	-6.5450	30.4890	fm	Morocco	Anti-Atlas Orogen	Bou Azzer-El Graara inlier	Ediacaran intrusions	diorite	U-Pb	625 ±8	zircon	ICPMS	crystallization age	ARC		140
554	-6.5540	30.3500	fm	Morocco	Anti-Atlas Orogen	Bou Azzer-El Graara inlier	Ediacaran intrusions	quartz diorite	U-Pb	586 ± 15	zircon	ICPMS	crystallization age	ARC		140
555	-7.7960	30.4870	fm	Morocco	Anti-Atlas Orogen	Sirwa inlier	Adrar-n-Takoucht Formation	rhyolitic crystal tuff (ignimbrite)	U-Pb	572 ± 5	zircon	SHRIMP II	crystallization age	POST-OROGENIC		141
556	-7.7740	30.4870	fm	Morocco	Anti-Atlas Orogen	Sirwa inlier	Tadoughast Formation	pyroclastic tuff	U-Pb	565 ± 6	zircon	SHRIMP II	crystallization age	RIFTING		141
557	-7.8520	30.3280	fm	Morocco	Anti-Atlas Orogen	Agadir Melloul - Jbel Iguiguil inlier	Tadoughast Formation	rhyolite	U-Pb	564 ± 6	zircon	SHRIMP II	crystallization age	RIFTING		141
558	-7.8350	30.3330	fm	Morocco	Anti-Atlas Orogen	Agadir Melloul - Jbel Iguiguil inlier	Tadoughast Formation	gray welded ignimbrites	U-Pb	565 ± 5	zircon	SHRIMP II	crystallization age	RIFTING		141
559	-7.7860	30.2970	fm	Morocco	Anti-Atlas Orogen	Agadir Melloul - Jbel Iguiguil inlier	Anammar Formation	dacite crystal tuff	U-Pb	561 ± 6	zircon	SHRIMP II	crystallization age	RIFTING		141
560	-7.8120	30.2340	fm	Morocco	Anti-Atlas Orogen	Agadir Melloul inlier	Adrar-n-Takoucht Formation	rhyolite	U-Pb	570 ± 5	zircon	SHRIMP II	crystallization age	POST-OROGENIC		141
561	-7.8100	30.2280	fm	Morocco	Anti-Atlas Orogen	Agadir Melloul - Jbel Iguiguil inlier	Tadoughast Formation	andesitic flow	U-Pb	566 ± 6	zircon	SHRIMP II	crystallization age	RIFTING		141

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
562	-7.8110	30.2120	fm	Morocco	Anti-Atlas Orogen	Agadir Melloul - Jbel Iguiguil inlier	Fajjoud Formation	gray welded massive lapilli-tuff	U-Pb	556 ± 5	zircon	SHRIMP II	crystallization age	RIFTING		141
563	-7.8860	30.2140	fm	Morocco	Anti-Atlas Orogen	Agadir Melloul - Jbel Iguiguil inlier	Tadoughast Formation	gray welded ignimbrites	U-Pb	567 ± 5	zircon	SHRIMP II	crystallization age	RIFTING		141
564	17.7500	22.1667	fm	Libya	Central Saharan Ghost Craton	Tibesti massif	Tibesti granites	two-mica granite	U-Pb	563.2 ± 1.9	zircon	ID-TIMS	crystallization age	POST-OROGENIC		142
565	17.7700	22.1700	fm	Libya	Central Saharan Ghost Craton	Tibesti massif	Tibesti granites	hornblende granite	U-Pb	557.6 ± 2.1	zircon	ID-TIMS	crystallization age	POST-OROGENIC		142
566	19.2167	23.3333	cop	Libya	Central Saharan Ghost Craton	Super Tibestian magmatic series	Kangara pluton	granitoids	Rb-Sr	560±4	WR	Isochrone	crystallization age	ARC		21
567	17.7420	22.2000	cop	Libya	Central Saharan Ghost Craton	Central Tibisti Massif	Wadi Yebigue	porphyritic granite	Rb-Sr	558± 5	WR	Isochrone	crystallization age	POST-OROGENIC		143
568	17.7000	22.1330	cop	Libya	Central Saharan Ghost Craton	Central Tibisti Massif	Wadi Yebigue	two-mica granite	Rb-Sr	548 ± 12	WR	Isochrone	crystallization age	POST-OROGENIC		143
569	0.7120	20.2160	fm	Mali	Trans-Saharan belt	Western Hoggar	Tilemsi magmatic arc	metaquartz diorite	U-Pb	726 +7/-3	zircon	ID-TIMS	crystallization age	ARC		144
570	0.6890	20.3480	fm	Mali	Trans-Saharan belt	Western Hoggar	Tilemsi magmatic arc	plagiogranite leucosome	U-Pb	710 +6/-5	zircon	ID-TIMS	crystallization age	ARC		144
571	0.9180	19.6660	fm	Mali	Trans-Saharan belt	Western Hoggar	Tilemsi magmatic arc	premetamorphic granodiorite	U-Pb	635± 5	zircon	ID-TIMS	crystallization age	ARC		144
572	2.4830	21.0650	fm	Mali	Trans-Saharan belt	Western Hoggar	Tirek granodiorite	granodiorite	Ar-Ar	613.3± 2.2	biotite	Plateau	crystallization age	SYN-OROGENIC		145
573	2.4550	20.7610	fm	Algeria	Trans-Saharan belt	Western Hoggar	The East In Ouzzal shear zone	ultramylonite	Ar-Ar	849.3 ± 7.9 to 749.0 ±3.2	hornblende	In situ spot fusion	crystallization age			145
574	2.4550	20.7610	fm	Algeria	Trans-Saharan belt	Western Hoggar	The East In Ouzzal shear zone	ultramylonite	Ar-Ar	649.5±2.4 to 625.9 ±2.2	ferrotschermakite	In situ spot fusion	metamorphism	METAMORPHISM		145
575	2.4430	20.7930	fm	Algeria	Trans-Saharan belt	Western Hoggar	The East In Ouzzal shear zone	banded mylonite sample	Ar-Ar	525 ± 5	biotite	In situ spot fusion	metamorphism	METAMORPHISM		145
576	2.4430	20.8020	fm	Algeria	High Atlas+C585	Western Hoggar	The East In Ouzzal shear zone	metasomatized country granitoid	Ar-Ar	611.0 ± 2.1	muscovite	stepwise	metamorphism	METAMORPHISM		145
577	2.4500	20.7980	fm	Algeria	Trans-Saharan belt	Western Hoggar	The East In Ouzzal shear zone	hydrothermally altered country granitoid	Ar-Ar	576.2 ± 2.0	muscovite	stepwise	metamorphism	LATE-OROGENIC		145
578	2.1665	22.0361	cop	Algeria	In Ouzzal rigid terrane	Tuareg shield	Tin Zebane dyke	gabbros and granites	Rb-Sr	592.2± 5.8	WR	Isochrone	emplacement	FAULTING		146
579	1.7665	19.1695	cop	Mali	Trans-Saharan belt	Western Hoggar	Adrar des Iforas	ultramylonite	Ar-Ar	535±6	K-feldspar	Plateau	metamorphism	FAULTING		147

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
580	5.5000	21.6667	cop	Algeria	Tuareg shield	Central Hoggar	Laouni, Azrou-n-Fad, Tefedest, Egere-Aleksod	garnet amphibolite	Sm-Nd	685± 19	amphibole-plagioclase-WR	Isochrone	metamorphism	METAMORPHISM		3
581	5.5000	21.6667	cop	Algeria	Tuareg shield	Central Hoggar	Laouni, Azrou-n-Fad, Tefedest, Egere-Aleksod	garnet amphibolite	Sm-Nd	522 ± 27	biotite-garnet-WR	Isochrone	metamorphism	METAMORPHISM		3
582	7.3333	25.0833	cop	Algeria	Tuareg shield	Central Hoggar	Ounane pluton	granitoid	Rb-Sr	615± 15	WR	Isochrone	emplacement	FAULTING		3
583	7.0000	25.0833	cop	Algeria	Tuareg shield	Central Hoggar	Tisselliline pluton	granitoid	Rb-Sr	555± 15	WR	Isochrone	emplacement	FAULTING		3
584	4.2378	21.7914	cop	Algeria	Tuareg shield	Western Hoggar	Tioueine pluton	quartz–syenite	U-Pb	523 ± 1	zircon	ID-TIMS	emplacement	FAULTING		148
585	4.2378	21.7914	cop	Algeria	Tuareg shield	Western Hoggar	Tioueine pluton	quartz–syenite	Pb-Pb	524 ± 14	zircon	evaporation	emplacement	FAULTING		148
586	-9.4808	30.6256	cop	Morocco	High Atlas	Western High Atlas	Tizgui dacite	dacite	U-Pb	532 ± 12	zircon	ICPMS	emplacement	INTRA-PLATE		149
587	-7.1872	33.7250		Morocco	Coastal Block	Western Meseta	Oued Rhebar Volcanic Complex	intermediate-mafic agglomerate	U-Pb	507 ± 5	zircon	SHRIMP	formation	RIFTING		150
588	-8.5099	33.2649	fm	Morocco	Coastal Block	El Jadida dome	El Jadida rhyolite	rhyolite	U-Pb	584.2 ± 4.8	zircon	SHRIMP	formation	ARC		151
589	-8.5103	33.2652	fm	Morocco	Coastal Block	El Jadida horst	El Jadida rhyolite	rhyolite	U-Pb	605 ± 11	zircon	SHRIMP	formation	ARC		151
590	-8.5102	33.2663	fm	Morocco	Coastal Block	El Jadida horst	El Jadida rhyolite	rhyolite	U-Pb	586.5 ± 4.9	zircon	SHRIMP	formation	ARC		151
591	-8.5099	33.2657	fm	Morocco	Coastal Block	El Jadida horst	El Jadida rhyolite	rhyolite	U-Pb	577 ± 3.8	zircon	SHRIMP	formation	ARC		151
592	-8.5101	33.2664	fm	Morocco	Coastal Block	El Jadida horst	El Jadida rhyolite	rhyolitic ignimbrites	U-Pb	577.2 ± 3.1	zircon	SHRIMP	formation	ARC		151
593	-8.5103	33.2657	fm	Morocco	Coastal Block	El Jadida horst	El Jadida rhyolite	rhyolitic ignimbrites	U-Pb	580 ± 1.4	zircon	SHRIMP	formation	ARC		151
594	-8.1125	31.1133	nc	Morocco	Western High Atlas	Tighardine-Takoucht massif	Tiniskt	microgranite	U-Pb	521 ± 5	zircon	SHRIMP	formation	RIFTING		152
595	2.1858	22.6412	fl	Algeria	Tuareg Shield	Western Hoggar	Tidéridjaouine	eclogite	U-Pb	623 ± 2	zircon	LA–ICP–MS	syn-collisional exhumation	OROGENIC		5
596	0.7160	19.4700	fm	Mali	Tuareg Shield	Adrar des Iforas	Tilemsi/Adjel'Hoc terrane	diorite	U-Pb	643 ± 4	zircon	ICP-MS	crystallization age	ARC		153
597	0.8420	19.3780	fm	Mali	Tuareg Shield	Adrar des Iforas	Tilemsi/Adjel'Hoc terrane	diatexite	U-Pb	626 ± 8	zircon	ICP-MS	crystallization age	OROGENIC		153
598	0.8420	19.9490	fm	Mali	Tuareg Shield	Adrar des Iforas	Tilemsi/Adjel'Hoc terrane	sub-alkali orthogneiss	U-Pb	716 ± 6	zircon	ICP-MS	crystallization of granite protolith	ARC		153
599	1.5740	19.7700	fm	Mali	Tuareg Shield	Adrar des Iforas	Kidal terrane	tonalite	U-Pb	604 ± 5	zircon	ICP-MS	crystallization	SYN-OROGENIC		153
600	0.9650	19.9060	fm	Mali	Tuareg Shield	Adrar des Iforas	Kidal terrane	monzogranite	U-Pb	599 ± 4	zircon	ICP-MS	crystallization	POST-OROGENIC		153
601	1.2220	18.2460	fm	Mali	Tuareg Shield	Adrar des Iforas	Kidal terrane	metadacite	U-Pb	623 ± 6	zircon	ICP-MS	crystallization of protolith	ARC		153

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
602	2.0320	18.2040	fm	Mali	Tuareg Shield	Adrar des Iforas	Tamaradant Domain	metadiorite	U-Pb	630 ± 6	zircon	ICP-MS	crystallization of protolith	ARC		153
603	9.6860	24.3770	fm	Algeria	Eastern Hoggar	Djanet Terrane	Djanet Batholith	porphyritic granite	U-Pb	571 ± 16	zircon	SHRIMP	crystallization age	ARC		154
604	9.5690	24.4210	fm	Algeria	Eastern Hoggar	Djanet Terrane	Tin Bedjane Pluton	syenogranite	U-Pb	568 ± 5	zircon	SHRIMP	crystallization	OROGENIC		154
605	9.7280	24.3820	fm	Algeria	Eastern Hoggar	Djanet Terrane	Tin Amali Dyke Swarm	rhyolitic dyke	U-Pb	558 ± 5	zircon	SHRIMP	emplacement age	OROGENIC		154
606	9.7220	24.1760	fm	Algeria	Eastern Hoggar	Djanet Terrane	Edembo Terrane	migmatite	Pb-Pb	596 ± 10	zircon	SHRIMP	maximum age for the age of the migmatitizatio n	SUTURE		154
607	9.7150	24.1870	fm	Algeria	Eastern Hoggar	Djanet Terrane	Edembo Terrane	granitic leucosome	U-Pb	568 ± 4	zircon	SHRIMP	formation of the granitic leucosome	SUTURE		154
608	15.4500	23.7667	fl	Libya	Mid-Saharan Craton	Tibisti Massif	Ben Ghnema batholith	granite	K-Ar	555 ± 22	biotite	isochrone	emplacement	ARC		155
609	15.4167	23.7667	fl	Libya	Mid-Saharan Craton	Tibisti Massif	Ben Ghnema batholith	adamellite	K-Ar	552 ± 24	biotite	isochrone	emplacement	ARC		155
610	15.4333	23.7500	fl	Libya	Mid-Saharan Craton	Tibisti Massif	Ben Ghnema batholith	adamellite	K-Ar	552 ± 22	biotite	isochrone	emplacement	ARC		155
611	15.3833	23.7500	fl	Libya	Mid-Saharan Craton	Tibisti Massif	Ben Ghnema batholith	granite	K-Ar	549 ± 22	biotite	isochrone	emplacement	ARC		155
612	15.4667	23.7167	fl	Libya	Mid-Saharan Craton	Tibisti Massif	Ben Ghnema batholith	granite	K-Ar	586 ± 24	biotite	isochrone	emplacement	ARC		155
613	15.4500	23.7167	fl	Libya	Mid-Saharan Craton	Tibisti Massif	Ben Ghnema batholith	granite	K-Ar	586 ± 23	biotite	isochrone	emplacement	ARC		155
614	15.4167	23.7167	fl	Libya	Mid-Saharan Craton	Tibisti Massif	Ben Ghnema batholith	adamellite	K-Ar	586 ± 24	biotite	isochrone	emplacement	ARC		155
615	15.4833	23.7667	fl	Libya	Mid-Saharan Craton	Tibisti Massif	Ben Ghnema batholith	granite	K-Ar	559 ± 22	WR	isochrone	emplacement	ARC		155
616	25.4603	22.4250	fl	Egypt	East Saharan craton	Arabian–Nubian Shield	Gebel Uweinat & Gebel Kamil	diorite	U-Pb	580 ± 3	zircon	LA-ICP-MS	crystallization age	INTRA-PLATE		156
617	25.4614	22.4243	fl	Egypt	East Saharan craton	Arabian–Nubian Shield	Gebel Uweinat & Gebel Kamil	granite	U-Pb	602 ± 2	zircon	LA-ICP-MS	crystallization age	INTRA-PLATE		156
618	25.4191	22.4719	fl	Egypt	East Saharan craton	Arabian–Nubian Shield	Gebel Uweinat & Gebel Kamil	granite	U-Pb	584 ± 4	zircon	LA-ICP-MS	crystallization age	INTRA-PLATE		156
619	25.9725	22.1785	fl	Egypt	East Saharan craton	Arabian–Nubian Shield	Gebel Uweinat & Gebel Kamil	granite	U-Pb	589 ± 2	zircon	LA-ICP-MS	crystallization age	INTRA-PLATE		156
620	26.2444	22.1421	fl	Egypt	East Saharan craton	Arabian–Nubian Shield	Gebel Uweinat & Gebel Kamil	granite	U-Pb	607 ± 2	zircon	LA-ICP-MS	crystallization age	INTRA-PLATE		156
621	26.4077	22.2669	fl	Egypt	East Saharan craton	Arabian–Nubian Shield	Gebel Uweinat & Gebel Kamil	microgranite	U-Pb	583 ± 2	zircon	LA-ICP-MS	crystallization age	INTRA-PLATE		156

NO	LON	LAT	ORG.*	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
622	26.4520	22.2121	fl	Egypt	East Saharan craton	Arabian–Nubian Shield	Gebel Uweinat & Gebel Kamil	monzonite	U-Pb	599 ± 2	zircon	LA-ICP-MS	crystallization age	INTRA-PLATE		156
623	26.6091	22.1915	fl	Egypt	East Saharan craton	Arabian–Nubian Shield	Gebel Uweinat & Gebel Kamil	granite	U-Pb	597 ± 3	zircon	LA-ICP-MS	crystallization age	INTRA-PLATE		156
624	28.9660	22.9783	fl	Egypt	East Saharan craton	Arabian–Nubian Shield	Bir Safsaf	granite	U-Pb	598 ± 5	zircon	LA-ICP-MS	crystallization age	INTRA-PLATE		156
625	29.2996	23.1317	fl	Egypt	East Saharan craton	Arabian–Nubian Shield	Bir Safsaf	granodiorite	U-Pb	585 ± 3	zircon	LA-ICP-MS	crystallization age	INTRA-PLATE		156
626	29.2975	23.0918	fl	Egypt	East Saharan craton	Arabian–Nubian Shield	Bir Safsaf	granite	U-Pb	590 ± 2	zircon	LA-ICP-MS	crystallization age	INTRA-PLATE		156
627	30.9510	22.5710	fl	Egypt	East Saharan craton	Arabian–Nubian Shield	Gebel El Asr	granodiorite	U-Pb	628 ± 4	zircon	LA-ICP-MS	crystallization age	INTRA-PLATE		156
628	30.9510	22.5710	fl	Egypt	East Saharan craton	Arabian–Nubian Shield	Gebel El Asr	granite	U-Pb	603 ± 4	zircon	LA-ICP-MS	crystallization age	INTRA-PLATE		156
629	30.9510	22.5710	fl	Egypt	East Saharan craton	Arabian–Nubian Shield	Gebel El Asr	granodiorite	U-Pb	605 ± 2	zircon	LA-ICP-MS	crystallization age	INTRA-PLATE		156
630	30.9510	22.5710	fl	Egypt	East Saharan craton	Arabian–Nubian Shield	Gebel El Asr	diorite	U-Pb	599 ± 2	zircon	LA-ICP-MS	crystallization age	INTRA-PLATE		156
631	31.7003	23.1585	fl	Egypt	East Saharan craton	Arabian–Nubian Shield	Gebel Umm Shaghir	monzonite	U-Pb	602 ± 3	zircon	LA-ICP-MS	crystallization age	INTRA-PLATE		156
632	34.1833	25.3670	fl	Egypt	East Saharan craton	Wadi Mubarak belt	El Umra Granite	granite	U-Pb	690 ± 21	zircon	Isochron	crystallization age	SYN-OROGENIC		157
633	34.2360	25.3083	fl	Egypt	East Saharan craton	Wadi Mubarak belt	El Umra Granite	granite	U-Pb	654 ± 5	zircon	Isochron	crystallization age	SYN-OROGENIC		157
634	30.0000	20.0000	cop	Sudan	East Saharan craton	Arabian–Nubian Shield	Nubian Desert red granite	granite	Rb-Sr	565 ± 8	WR	Isochron	crystallization age	POST-OROGENIC		158
635	29.3000	23.0000	cop	Egypt	East Saharan craton	Arabian–Nubian Shield	Bir Safsaf granodiorite	granodiorite	Rb-Sr	564 ± 77	WR	Isochron	crystallization age	POST-OROGENIC		158
636	29.0000	17.6000	cop	Sudan	East Saharan craton	Arabian–Nubian Shield	Wadi Howar microgranite	microgranite	Rb-Sr	585 ± 19	WR	Isochron	crystallization age	POST-OROGENIC		158
637	30.0000	20.0000	cop	Sudan	East Saharan craton	Arabian–Nubian Shield	Nubian Desert microgranite	microgranite	Rb-Sr	623 ± 37	WR	Isochron	crystallization age	POST-OROGENIC		158
638	26.3410	22.1300	cop	Egypt	East Saharan craton	Arabian–Nubian Shield	Gebel Kamil migmatite	migmatite	Rb-Sr	673 ± 56	WR	Isochron	migmatization age	OROGENIC		158
639	29.0000	17.6000	cop	Sudan	East Saharan craton	Arabian–Nubian Shield	Wadi Howar migmatite	migmatite	Rb-Sr	686 ± 26	WR	Isochron	migmatization age	OROGENIC		158
640	30.0000	20.0000	cop	Sudan	East Saharan craton	Arabian–Nubian Shield	Nubian Desert gneiss	gneiss	Rb-Sr	918 ± 40	WR	Isochron	migmatization age	PRE-OROGENIC		158
641	36.9830	26.1360	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Imdan complex	gabbro	U-Pb	747 ± 3	zircon	SHRIMP	crystallization age	ARC	159	160
642	37.2770	25.8380	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Nabt complex	tonalite	U-Pb	739 ± 4	zircon	SHRIMP	crystallization age	ARC	159	160

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
643	37.2770	25.8380	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Nabt complex	diorite	U-Pb	737 ± 10	zircon	SHRIMP	crystallization age	ARC	159	160
644	37.3350	26.0500	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Bayda group	felsic lava/sill?	U-Pb	711 ± 12	zircon	SHRIMP	crystallization age	ARC	159	160
645	36.1350	26.7690	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Rhyolitic dike	rhyolitic dike	U-Pb	687 ± 2	zircon	SHRIMP	crystallization age	ARC	159	160
646	36.0880	26.9230	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Buwaydah complex	granodiorite	U-Pb	686 ± 4	zircon	SHRIMP	crystallization age	ARC	159	160
647	36.5450	26.3580	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Imdan complex	granodiorite	U-Pb	676 ± 6	zircon	SHRIMP	crystallization age	ARC	159	161
648	36.3790	26.5060	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Liban complex	monzogranite	U-Pb	635 ± 5	zircon	SHRIMP	crystallization age	RIFTING	159	160
649	36.1990	26.8540	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Kara Dakha complex	syenogranite	U-Pb	632 ± 4	zircon	SHRIMP	crystallization age	RIFTING	159	160
650	37.1640	26.4390	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Abu Suar complex	syenogranite	U-Pb	626 ± 4	zircon	SHRIMP	crystallization age	RIFTING	159	161
651	37.1740	26.5840	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Ash Shab complex	granite	U-Pb	609 ± 4	zircon	SHRIMP	crystallization age	RIFTING	159	161
652	37.1550	26.8020	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Hadb complex	granite	U-Pb	609 ± 3	zircon	SHRIMP	crystallization age	RIFTING	159	161
653	37.2090	25.8210	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Nabt complex	microgabbro	U-Pb	774 ± 14	zircon	SHRIMP	crystallization age	ARC	159	160
654	37.3220	25.9420	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Midyan terrane	deformed granodiorite-tonalite	U-Pb	668 ± 8	zircon	LA-ICP-MS	crystallization age	ARC	159	163
655	37.3800	25.7350	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Midyan terrane	deformed granodiorite-tonalite	U-Pb	742 ± 5	zircon	LA-ICP-MS	crystallization age	ARC	159	163
656	36.6850	26.7270	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Midyan terrane	mylonitized granodiorite-granite	U-Pb	720 ± 3	zircon	SHRIMP	crystallization age	ARC	159	160
657	37.3300	25.4980	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Hanabiq	metatonalite	U-Pb	714 ± 17	zircon	SHRIMP	crystallization age	ARC	159	160
658	37.0010	26.1010	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Midyan terrane	orthogneiss	U-Pb	705 ± 4	zircon	SHRIMP	crystallization age	ARC	159	161
659	37.4200	25.8300	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Midyan terrane	mylonitic orthogneiss	U-Pb	701 ± 10	zircon	SHRIMP	crystallization age	ARC	159	160
660	37.0710	26.0690	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Midyan terrane	diorite	U-Pb	696 ± 6	zircon	LA-ICP-MS	crystallization age	ARC	159	163
661	36.7110	26.6560	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Midyan terrane	granite gneiss	U-Pb	692 ± 4	zircon	SHRIMP	crystallization age	ARC	159	160

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
662	37.5000	25.8200	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Hamadat	orthogneiss	U-Pb	688 ± 3	zircon	SHRIMP	crystallization age	ARC	159	162
663	37.0110	26.2160	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Baladiyah	orthogneiss	U-Pb	611 ± 8	zircon	SHRIMP	crystallization age	RIFTING	159	160
664	37.0990	26.0860	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Midyan terrane	mylonitic granite	U-Pb	601 ± 3	zircon	LA-ICP-MS	crystallization age	RIFTING	159	163
665	36.1060	27.0880	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Midyan terrane	mylonitic orthogneiss	U-Pb	600 ± 4	zircon	SHRIMP	crystallization age	RIFTING	159	162
666	37.3530	25.6550	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Midyan terrane	mylonitic orthogneiss	U-Pb	590 ± 3	zircon	SHRIMP	crystallization age	RIFTING	159	160
667	37.2920	25.9730	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Midyan terrane	mylonitic granite	U-Pb	584 ± 3	zircon	LA-ICP-MS	crystallization age	RIFTING	159	163
668	37.2450	26.0730	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Midyan terrane	undeformed granite	U-Pb	581 ± 4	zircon	LA-ICP-MS	crystallization age	RIFTING	159	163
669	37.2480	26.0020	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Midyan terrane	foliated granite	U-Pb	575 ± 10	zircon	SHRIMP	crystallization age	RIFTING	159	161
670	37.2200	26.0050	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Midyan terrane	dike: lamprophyre?	U-Pb	573 ± 5	zircon	SHRIMP	crystallization age	RIFTING	159	161
671	37.7230	25.6610	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Hamadat	alkali-feldspar granite gneiss	U-Pb	569 ± 1	zircon	SHRIMP	crystallization age	RIFTING	159	162
672	37.4430	26.6650	fm	Saudi Arabia	Arabian Shield	Midyan terrane	Jibalah gp., Dhaika fm.	tuff	U-Pb	569 ± 3	zircon	LA-ICP-MS	crystallization age	RIFTING	159	164,165
673	37.1367	26.4268	fm	Saudi Arabia	Arabian Shield	Al Muwaylih Quadrangle	Bayda Group	volcaniclastic	U-Pb	700–660	zircon	SHRIMP	crystallization age	ARC	166	161
674	33.3753	19.3767	fm	Sudan	Arabian-Nubian Shield	Keraf Suture	Abu Hamed Shear Zone	deformed granite	Ar-Ar	577 ± 2	hornblende	plateau	Sinistral transport	FAULTING		167
675	33.3753	19.3767	fm	Sudan	Arabian-Nubian Shield	Keraf Suture	Abu Hamed Shear Zone	deformed granite	Ar-Ar	577 ± 5	biotite	plateau	Sinistral transport	FAULTING		167
676	33.7425	18.3228	fm	Sudan	Arabian-Nubian Shield	Keraf Suture	Nabati ring complex	granite	Rb-Sr	573 ± 70	WR	isochrone	Sinistral transport	FAULTING	167	168
677	44.0617	18.2650		Saudi Arabia	Arabian-Nubian Shield	Afif terrane	J. Ashirah core	monzo granite	U-Pb	637 ±7	zircon	ID-TIMS	crystallization age	POST-OROGENIC		169
678	43.1200	19.4667		Saudi Arabia	Arabian-Nubian Shield	Nabitah erogenic belt	Al Hassir rim	K-feldspar granite	U-Pb	628 ±1	zircon	ID-TIMS	crystallization age	POST-OROGENIC		169
679	43.7967	22.1983		Saudi Arabia	Arabian-Nubian Shield	Afif terrane	J. Dahul inner rim	K-feldspar granite	U-Pb	601 ±1	zircon	ID-TIMS	crystallization age	POST-OROGENIC		169
680	41.4367	27.3383		Saudi Arabia	Arabian-Nubian Shield	Afif terrane	J. Aja rim	K-feldspar granite	U-Pb	566 ±1	zircon	ID-TIMS	crystallization age	POST-OROGENIC		169
681	35.6417	27.9217		Saudi Arabia	Arabian-Nubian Shield	Midyan teraane	J. Dibbagh rim	K-feldspar granite	U-Pb	577±13	zircon	ID-TIMS	crystallization age	POST-OROGENIC		169

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
682	34.0394	25.9419		Egypt	Central Eastern Desert	Karaim Basin	Wadi Kareim	gabbro	U-Pb	730±22	zircon	SHRIMP-RG	crystallization age	ARC		170
683	34.0358	25.9442		Egypt	Central Eastern Desert	Karaim Basin	Wadi Kareim	diabase	U-Pb	743±45	zircon	SHRIMP-RG	crystallization age	ARC		170
684	34.0375	25.9478		Egypt	Central Eastern Desert	Karaim Basin	Wadi Kareim	felsic Tuff	U-Pb	769±29	zircon	SHRIMP-RG	crystallization age	ARC		170
685	43.5833	23.0000		Saudi Arabia	Arabian Shield	Afif terrane	Jabal Kirsh (Dome)	biotite paragneiss	Ar-Ar	557±15	biotite	isochrone	cooling age	EXTENSION		171
686	44.6420	24.5390	fm	Saudi Arabia	Arabian Shield	Al-Amar Suture	Ridayniyah ophiolitic melange	sheared amphibolite	Ar-Ar	610 ±2	hornblende	plateau	cooling (uplift) age	FAULTING		172
687	44.6750	24.3950	fm	Saudi Arabia	Arabian Shield	Al-Amar Suture	Ridayniyah ophiolitic melange	isotropic metagabbros (block)	Ar-Ar	612 ±3	hornblende	plateau	cooling (uplift) age	FAULTING		172
688	44.6520	24.3240	fm	Saudi Arabia	Arabian Shield	Al-Amar Suture	Ridayniyah ophiolitic melange	isotropic metagabbros (block)	Ar-Ar	596 ±6	hornblende	plateau	cooling (uplift) age	FAULTING		172
689	44.6520	24.2650	fm	Saudi Arabia	Arabian Shield	Al-Amar Suture	Ridayniyah ophiolitic melange	isotropic metagabbros (block)	Ar-Ar	611 ±8	hornblende	plateau	cooling (uplift) age	FAULTING		172
690	35.8763	27.8553		Saudi Arabia	Arabian Shield	Midyan Terrane	Ghawjah Metavolcanic	Porphyritic andesite	U-Pb	763 ± 25	zircon	SIMS	crystallization age	ARC		173
691	35.8421	27.9645		Saudi Arabia	Arabian Shield	Midyan Terrane	Sawawin complex	coarse-grained diorite	U-Pb	661.5 ± 2.3	zircon	SIMS	crystallization age	?		173
692	35.7947	27.9285		Saudi Arabia	Arabian Shield	Midyan Terrane	Sawawin complex	felsic sill	U-Pb	648 ± 17	zircon	SHRIMP-RG	crystallization age	?		173
693	44.3470	23.4770		Saudi Arabia	Arabian Shield	Al-Amar Suture	Halaban Ophiolite	metagabbro	Ar-Ar	679 ± 4	hornblende	plateau	cooling age	METAMORPHISM		174
694	44.3180	23.4340		Saudi Arabia	Arabian Shield	Al-Amar Suture	Halaban Ophiolite	metagabbro	Ar-Ar	679 ± 6	hornblende	plateau	cooling age	METAMORPHISM		174
695	44.3530	23.4620		Saudi Arabia	Arabian Shield	Al-Amar Suture	Halaban Ophiolite	hornblendite	Ar-Ar	681 ± 3	hornblende	plateau	cooling age	METAMORPHISM		174
696	44.3340	23.3940		Saudi Arabia	Arabian Shield	Al-Amar Suture	Halaban Ophiolite	amphibolite	Ar-Ar	679 ± 6	hornblende	plateau	cooling age	METAMORPHISM		174
697	44.4040	23.2830		Saudi Arabia	Arabian Shield	Al-Amar Suture	Halaban Ophiolite	amphibolite	Ar-Ar	597 ± 4	hornblende	plateau	cooling age	METAMORPHISM		174
698	44.4450	23.4640		Saudi Arabia	Arabian Shield	Al-Amar Suture	Halaban Ophiolite	garnet–biotite schist	Ar-Ar	597 ± 2	Biotite	plateau	cooling age	METAMORPHISM		174
699	44.4170	23.3920		Saudi Arabia	Arabian Shield	Al-Amar Suture	Halaban Ophiolite	migmatite	Ar-Ar	601 ± 4	hornblende	plateau	cooling age	METAMORPHISM		174
700	44.1820	23.6070		Saudi Arabia	Arabian Shield	Al-Amar Suture	Halaban Ophiolite	quartz diorite	Ar-Ar	675 ± 4	hornblende	plateau	cooling age	METAMORPHISM		174

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
701	44.2230	23.6040		Saudi Arabia	Arabian Shield	Al-Amar Suture	Halaban Ophiolite	diorite	Ar-Ar	681 ± 5	hornblende	plateau	cooling age	METAMORPHISM		174
702	42.0000	20.0000	cop	Saudi Arabia	Arabian Shield	Jiddah Group	Surgah Formation	rhyolite	Rb-Sr	721 ± 55	WR	isochrone	crystallization age	ARC		175
703	43.6933	20.7883		Saudi Arabia	Arabian Shield	Southern Najd	Jabal Yafikh	hornblende, tornalite gneiss	U-Pb	666 ± 8	zircon	ID-TIMS	crystallization age	ARC		175
704	42.7933	20.0983		Saudi Arabia	Arabian Shield	Southern Najd	Junaynah	granite	U-Pb	678 ± 10	zircon	ID-TIMS	crystallization age	ARC		176
705	42.0317	18.7317		Saudi Arabia	Arabian Shield	Asir	Jabal Aya	granodiorite gneiss	U-Pb	778 ± 9	zircon	ID-TIMS	crystallization age	ARC		176
706	42.0150	18.8183		Saudi Arabia	Arabian Shield	Asir	Jabal Aya	biotite leuco-adamellite	U-Pb	763 ± 4	zircon	ID-TIMS	crystallization age	ARC		176
707	41.9900	18.9367		Saudi Arabia	Arabian Shield	Tihamat Ash sham	Wadi Hali	biotite tonalite gneiss	U-Pb	797± 15	zircon	ID-TIMS	crystallization age	ARC		176
708	43.0550	17.6950		Saudi Arabia	Arabian Shield	Asir	Wadi Atf	tonalite gneiss	U-Pb	663 ± 9	zircon	ID-TIMS	crystallization age	ARC		176
709	43.3083	18.2650		Saudi Arabia	Arabian Shield	Asir	Wadi Tarib	adamellite	U-Pb	660 ± 7	zircon	ID-TIMS	crystallization age	ARC		176
710	43.7833	18.9833		Saudi Arabia	Arabian Shield	Asir	Wadi Tarib	metagabbro	U-Pb	664 ± 12	zircon	ID-TIMS	crystallization age	ARC		176
711	43.3267	18.1117		Saudi Arabia	Arabian Shield	Asir	Wadi Tarib	biotite granodiorite gneiss	U-Pb	714 ± 28	zircon	ID-TIMS	crystallization age	ARC		176
712	42.2000	19.0502		Saudi Arabia	Arabian Shield	Asir	Asir	biotite tonalite gneiss	U-Pb	816 ± 4	zircon	ID-TIMS	crystallization age	ARC		176
713	34.9350	29.5870		Israel	Arabian-Nubian Shield	Elat area	Shahmon Metabasite	gabbro	Ar-Ar	616 ± 3	amphibole	plateau	cooling (unroofing)	EXTENSION		177
714	34.9230	29.5140		Israel	Arabian-Nubian Shield	Elat area	Elat Schists	garnet–sillimanite metapelite	Ar-Ar	592± 4	biotite	plateau	cooling (unroofing)	EXTENSION		177
715	34.9230	29.5140		Israel	Arabian-Nubian Shield	Elat area	Elat Schists	garnetiferous leucosome	Ar-Ar	598.4± 1.4	muscovite	plateau	cooling (unroofing)	EXTENSION		177
716	34.9080	29.4950		Israel	Arabian-Nubian Shield	Elat area	Taba Tonalite	tonalite gneiss	Ar-Ar	601.4± 2	biotite	plateau	cooling (unroofing)	EXTENSION		177
717	34.9380	29.5800		Israel	Arabian-Nubian Shield	Elat area	Elat Granite Gneiss	gneiss	Ar-Ar	607	biotite	plateau	cooling (unroofing)	EXTENSION		177
718	34.9380	29.5690		Israel	Arabian-Nubian Shield	Elat area	Elat Granite	granite	Ar-Ar	597± 1.4	biotite	plateau	cooling	POST-OROGENIC		177
719	19.3740	22.9120	cop	Libya	Arabian-Nubian Shield	Jabal Eghei Area	Addaba Mohamed Salah pluton	hornblende-biotite granite	Rb-Sr	552 ± 3	WR	isochrone	crystallization age	POST-OROGENIC		178
720	19.3740	22.9120	cop	Libya	Arabian-Nubian Shield	Jabal Eghei Area	Addaba Mohamed Salah pluton	hornblende-biotite granite	Rb-Sr	547 ± 6	WR	isochrone	crystallization age	POST-OROGENIC		178

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
721	19.2230	22.9120	cop	Libya	Arabian-Nubian Shield	Jabal Eghei Area	Kangara pluton	granite	Rb-Sr	554 ± 6	WR	isochrone	crystallization age	POST-OROGENIC		178
722	19.0930	23.2920	cop	Libya	Arabian-Nubian Shield	Jabal Eghei Area	Kangara-Tushidi pluton	granite	Rb-Sr	528 ± 7	WR	isochrone	crystallization age	POST-OROGENIC		178
723	19.5680	23.3580	cop	Libya	Arabian-Nubian Shield	Jabal Eghei Area	Zouma Stock	K-feldspar granite	Rb-Sr	532 ± 7	WR	isochrone	crystallization age	POST-OROGENIC	178	179
724	19.2810	23.2520	cop	Libya	Arabian-Nubian Shield	Jabal Eghei Area	Kangara rhyolite	rhyolite	Rb-Sr	530 ± 7	WR	isochrone	crystallization age	POST-OROGENIC		178
725	19.2810	23.2520	cop	Libya	Arabian-Nubian Shield	Jabal Eghei Area	Kangara rhyolite	rhyolite	Rb-Sr	537 ± 7	WR	isochrone	crystallization age	POST-OROGENIC		178
726	19.2810	23.2520	cop	Libya	Arabian-Nubian Shield	Jabal Eghei Area	Kangara rhyolitic dike	rhyolite	Rb-Sr	559 ± 35	WR	isochrone	crystallization age	POST-OROGENIC		178
727	19.2000	23.2700	cop	Libya	Arabian-Nubian Shield	Jabal Eghei Area	SB dike (K-T)	silicified breccia (fault zone)	Rb-Sr	499 ± 7	WR	isochrone	crystallization age	FAULTING		178
728	26.4167	22.1667	cop	Egypt	Arabian-Nubian Shield	Gebel Kamil Area	Gebel Kamil	migmatite	Rb-Sr	673 ± 56	WR	isochrone	metamorphism	METAMORPHISM		180
729	41.3400	23.4967		Saudi Arabia	Arabian-Nubian Shield	north Harrat Kishb	Alse-Hairah pluton	granitoid	Rb-Sr	567±86	WR	isochrone	crystallization age	POST-OROGENIC		181
730	41.5550	23.4933		Saudi Arabia	Arabian-Nubian Shield	north Harrat Kishb	Jabal Abu Aris quadrangle	tonalite gneiss	Rb-Sr	774±101	WR	isochrone	crystallization age	ARC		181
731	42.6817	23.4467		Saudi Arabia	Arabian-Nubian Shield	Numan quadrangle	Al Bara batholith	granite	Rb-Sr	571±19	WR	isochrone	crystallization age	POST-OROGENIC		181
732	42.8917	23.6083		Saudi Arabia	Arabian-Nubian Shield	Afif area	Afif quarangle	granodiorite	Rb-Sr	718±25	WR	isochrone	crystallization age	ARC		181
733	42.4300	23.9217		Saudi Arabia	Arabian-Nubian Shield	Afif area	Jabal al Usaybiyat	syenogranite	Rb-Sr	602±9	WR	isochrone	crystallization age	POST-OROGENIC		181
734	43.1583	24.9017		Saudi Arabia	Arabian-Nubian Shield	northwest Ad Dawadimi	Jabal Tukhfah	granite	Rb-Sr	563±71	WR	isochrone	crystallization age	POST-OROGENIC		181
735	43.8533	24.7950		Saudi Arabia	Arabian-Nubian Shield	northwest Ad Dawadimi	Jabal Jabalah	granite	Rb-Sr	575±7	WR	isochrone	crystallization age	POST-OROGENIC		181
736	45.0700	24.0650		Saudi Arabia	Arabian-Nubian Shield	Marjan area	Northern pluton	tonalite to quartz diorite	Rb-Sr	604±61	WR	isochrone	crystallization age	POST-OROGENIC		181
737	45.1550	24.0133		Saudi Arabia	Arabian-Nubian Shield	Marjan area	Al Mizil pluton	tonalite to trondhjemite	Rb-Sr	509±157	WR	isochrone	crystallization age	POST-OROGENIC		181
738	40.0533	21.0217		Saudi Arabia	Arabian-Nubian Shield	Wadi Sadiyah quadrangle	Bir ad Damm	granite gneiss	Rb-Sr	542±23	WR	isochrone	crystallization age	POST-OROGENIC		181
739	41.1783	20.8150		Saudi Arabia	Arabian-Nubian Shield	Wadi Shuqub quadrangle	Wadi Dhurah	tonalite	Rb-Sr	838±93	WR	isochrone	crystallization age	ARC		181

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
740	44.4517	22.7283		Saudi Arabia	Arabian-Nubian Shield	south of Halaban	Uyaijah	granite	Rb-Sr	595±15	WR	isochrone	crystallization age	POST-OROGENIC		181
741	45.0700	24.0650		Saudi Arabia	Arabian-Nubian Shield	Marjan area	Northern pluton	tonalite	K-Ar	600±4	biotite		crystallization age	POST-OROGENIC		181
742	45.0700	24.0650		Saudi Arabia	Arabian-Nubian Shield	Marjan area	Northern pluton	tonalite	K-Ar	601±5	hornblende		crystallization age	POST-OROGENIC		181
743	45.0700	24.0650		Saudi Arabia	Arabian-Nubian Shield	Marjan area	Northern pluton	Tonalite	Ar-Ar	608±5	hornblende	isochrone	crystallization age	POST-OROGENIC		181
744	36.1280	26.8150	fm	Saudi Arabia	Arabian-Nubian Shield	Midyan arc basement	Zaam group	tonalite	U-Pb	725±4	zircon	ID-TIMS (upper intercept)	crystallization age	ARC		182
745	35.8110	27.3920	fm	Saudi Arabia	Arabian-Nubian Shield	Midyan arc basement	Duba complex	diorite	U-Pb	710±5	zircon	ID-TIMS (upper intercept)	crystallization age	ARC		182
746	37.0310	26.1880	fm	Saudi Arabia	Arabian-Nubian Shield	Midyan arc basement	Baladiyah complex	gneissic tonalite	U-Pb	676±4	zircon	ID-TIMS (upper intercept)	crystallization age	ARC		182
747	36.3090	27.0150	fm	Saudi Arabia	Arabian-Nubian Shield	Midyan arc basement	Qazaz complex	gneiss	Rb-Sr	672±30	WR	isochrone	crystallization age	ARC		182
748	36.8920	26.2220	fm	Saudi Arabia	Arabian-Nubian Shield	Midyan arc basement	Baladiyah complex	granodiorite	U-Pb	660±4	zircon	ID-TIMS (upper intercept)	crystallization age	ARC		182
749	35.6950	27.6830	fm	Saudi Arabia	Arabian-Nubian Shield	Midyan arc basement	Shar complex	alkali granite	U-Pb	625±5	zircon	ID-TIMS (upper intercept)	crystallization age	POST-OROGENIC		182
750	36.4640	26.4550	fm	Saudi Arabia	Arabian-Nubian Shield	Midyan arc basement	Liban complex	monzogranite	U-Pb	621±7	zircon	ID-TIMS (upper intercept)	crystallization age	POST-OROGENIC		182
751	35.4320	27.9890	fm	Saudi Arabia	Arabian-Nubian Shield	Midyan arc basement	Sadr complex	monzogranite	U-Pb	599±5	zircon	ID-TIMS (upper intercept)	crystallization age	POST-OROGENIC		182
752	35.6350	27.9670	fm	Saudi Arabia	Arabian-Nubian Shield	Midyan arc basement	Dabbagh complex	alkali granite	U-Pb	577±4	zircon	ID-TIMS (upper intercept)	crystallization age	POST-OROGENIC		182
753	35.6950	27.6830	fm	Saudi Arabia	Arabian-Nubian Shield	Midyan arc basement	Shar complex	alkali granite	Rb-Sr	630±10	WR	isochrone	crystallization age	POST-OROGENIC		182
754	36.4640	26.4550	fm	Saudi Arabia	Arabian-Nubian Shield	Midyan arc basement	Liban complex	monzogranite	Rb-Sr	638±10	WR	isochrone	crystallization age	POST-OROGENIC		182
755	35.4320	27.9890	fm	Saudi Arabia	Arabian-Nubian Shield	Midyan arc basement	Sadr complex	monzogranite	Rb-Sr	598±30	WR	isochrone	crystallization age	POST-OROGENIC		182
756	35.6350	27.9670	fm	Saudi Arabia	Arabian-Nubian Shield	Midyan arc basement	Dabbagh complex	alkali granite	Rb-Sr	570±7	WR	isochrone	crystallization age	POST-OROGENIC		182
757	41.5682	25.6912	cop	Saudi Arabia	Arabian-Nubian Shield	basement of Jifn Basin	Murdamah Rhyolites	rhyolite	U-Pb	624.9 ±4.2	zircon	ID-TIMS (upper intercept)	crystallization age	FAULTING		183
758	41.5741	25.5918	cop	Saudi Arabia	Arabian-Nubian Shield	Jifn Basin	Jibalah Group cross-cutting volcanics	felsite dyke	U-Pb	576.6 ±5.3	zircon	ID-TIMS (upper intercept)	crystallization age	FAULTING		183

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
759	36.1920	23.6110	fm	Egypt	Arabian-Nubian Shield	Zabargad island	Gneiss unit	felsic granulite	Rb-Sr	655 ± 8	gt-opx-pl-WR	isochrone	HP-HT metamorphic event	METAMORPHISM		184
760	36.1920	23.6110	fm	Egypt	Arabian-Nubian Shield	Zabargad island	Gneiss unit	felsic granulite	Sm-Nd	699 ± 34	gt-opx-WR	isochrone	HP-HT metamorphic event	METAMORPHISM		184
761	41.1706	20.8196	cop	Saudi Arabia	Arabian-Nubian Shield	west-central Arabian Shield	Wadi Shuqub quadrangle	tonalite-quartz diorite	Rb-Sr	854 ± 10	WR	isochrone	crystallization age	ARC		185
762	41.2740	20.6564	cop	Saudi Arabia	Arabian-Nubian Shield	west-central Arabian Shield	Wadi Shuqub quadrangle	diorite-tonalite stock	Rb-Sr	815 ± 13	WR	isochrone	crystallization age	ARC		185
763	41.2245	20.7014	cop	Saudi Arabia	Arabian-Nubian Shield	west-central Arabian Shield	Gabalat area	biotite-granite	Rb-Sr	552 ±20	WR	isochrone	crystallization age	POST-OROGENIC		185
764	39.5909	21.3321	cop	Saudi Arabia	Arabian-Nubian Shield	Jeddah-Makkah Region	Bahrah Granodiorite-Granite Complex	granite-granodiorite	Rb-Sr	665 ± 12	WR	isochrone	crystallization age	ARC		185
765	33.8362	17.8215	cop	Sudan	Arabian-Nubian Shield	NE Bayuda Desert	Abu Harik Complex	aplite, granite, granodiorite	Rb-Sr	898 ±51	WR	isochrone	crystallization age	ARC		186
766	33.3407	19.3516	cop	Sudan	Arabian-Nubian Shield	NE Bayuda Desert	El Koro Volcanic Series	volcaniclastic agglomerate	Rb-Sr	800 ± 83	WR	isochrone	crystallization age	ARC		186
767	33.2904	19.4803	cop	Sudan	Arabian-Nubian Shield	NE Bayuda Desert	Diefallab Granite	biotite granites	Rb-Sr	678 ± 43	WR	isochrone	crystallization age	ARC		186
768	33.0678	19.5118	cop	Sudan	Arabian-Nubian Shield	NE Bayuda Desert	Shallal Granite	biotite granites	Rb-Sr	549 ± 12	WR	isochrone	crystallization age	POST-OROGENIC		186
769	43.4930	17.9590	fm	Saudi Arabia	Arabian Shield	Nabitah erogenic belt	Talhah	tonalite gneiss	U-Pb	732±3	zircon	ID-TIMS (upper intercept)	crystallization age	ARC		187
770	43.2430	18.0330	fm	Saudi Arabia	Arabian Shield	Nabitah erogenic belt	Suwaydah	tonalite gneiss	U-Pb	729±3	zircon	ID-TIMS (upper intercept)	crystallization age	ARC		187
771	43.4500	18.3680	fm	Saudi Arabia	Arabian Shield	Nabitah erogenic belt	Wadi Arin	tonalite	U-Pb	674±6	zircon	ID-TIMS (upper intercept)	crystallization age	ARC		187
772	43.2430	18.7140	fm	Saudi Arabia	Arabian Shield	Nabitah erogenic belt	Mahda	two -mica granite	U-Pb	670±6	zircon	ID-TIMS (upper intercept)	crystallization age	ARC		187
773	42.6540	18.2470	fm	Saudi Arabia	Arabian Shield	Hijah-Asir belt	Khamis Mushayt	quartz diorite	U-Pb	667±4	zircon	ID-TIMS (upper intercept)	crystallization age	SYN-OROGENIC		187
774	43.2500	18.2760	fm	Saudi Arabia	Arabian Shield	Nabitah erogenic belt	Hijrat	trondhjemite gneiss	U-Pb	657±3	zircon	ID-TIMS (upper intercept)	crystallization age	SYN-OROGENIC		187
775	42.8140	18.3000	fm	Saudi Arabia	Arabian Shield	Hijah-Asir belt	Khamis Mushayt	granodiorite gneiss	U-Pb	654±7	zircon	ID-TIMS (upper intercept)	crystallization age	SYN-OROGENIC		187
776	43.2240	18.3300	fm	Saudi Arabia	Arabian Shield	Nabitah erogenic belt	Al Ar	tonalite gneiss (?)	U-Pb	644±3	zircon	ID-TIMS (upper intercept)	crystallization age	SYN-OROGENIC		187
777	43.9870	18.4150	fm	Saudi Arabia	Arabian Shield	Nabitah erogenic belt	Wadi Makhdhul	quartz diorite	U-Pb	642±5	zircon	ID-TIMS (upper intercept)	crystallization age	SYN-OROGENIC		187

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
778	44.1140	18.0390	fm	Saudi Arabia	Arabian Shield	Nabitah erogenic belt	Wadi Simlal	quartz diorite	U-Pb	641±2	zircon	ID-TIMS (upper intercept)	crystallization age	SYN-OROGENIC		187
779	43.6430	18.0220	fm	Saudi Arabia	Arabian Shield	Nabitah erogenic belt	Jabal Tharwah	biotite monzogranite	U-Pb	641±10	zircon	ID-TIMS (upper intercept)	crystallization age	SYN-OROGENIC		187
780	44.4860	17.5900	fm	Saudi Arabia	Arabian Shield	Nabitah erogenic belt	A'ashiba quartz	diorite gneiss	U-Pb	640±3	zircon	ID-TIMS (upper intercept)	crystallization age	SYN-OROGENIC		187
781	43.0070	18.2450	fm	Saudi Arabia	Arabian Shield	Nabitah erogenic belt	Tindahah	biotite monzogranite	U-Pb	635±15	zircon	ID-TIMS (upper intercept)	crystallization age	SYN-OROGENIC		187
782	43.0983	17.3215		Saudi Arabia	Arabian Shield	Nabitah Mobile Belt	Tayyah Belt	granitic dyke	U-Pb	645.8 ±1.7	zircon	SIMS	crystallization age	SYN-OROGENIC		188
783	40.2625	22.3601		Saudi Arabia	Arabian Shield	Makkah Suite	Asir	gabbro/tonalite	U-Pb	845.6±4.9	zircon	SIMS	crystallization age	ARC		188
784	40.4546	22.4483		Saudi Arabia	Arabian Shield	Al Hawiyah Suite	Asir	granite	U-Pb	591.9±5.2	zircon	SIMS	crystallization age	EXTENSION		188
785	42.7515	21.3362		Saudi Arabia	Arabian Shield	Kawr Suite	Asir	alkali granite	U-Pb	611.7±6.5	zircon	SIMS	crystallization age	POST-OROGENIC		188
786	42.7515	21.3362		Saudi Arabia	Arabian Shield	Kawr Suite	Asir	alkali granite	U-Pb	60±128	zircon	SIMS	crystallization age	POST-OROGENIC		188
787	42.8330	19.4527		Saudi Arabia	Arabian Shield	Wadbah Suite	Asir	alkali granite	U-Pb	615.9±4.9	zircon	SIMS	crystallization age	POST-OROGENIC		188
788	42.9957	19.4872		Saudi Arabia	Arabian Shield	Ibn Hashbal Suite	Asir	alkali granite	U-Pb	617.6±5.2	zircon	SIMS	crystallization age	POST-OROGENIC		188
789	44.3014	20.3945		Saudi Arabia	Arabian Shield	Al Hafoor Suite	Tathlith	alkali granite	U-Pb	636±4	zircon	SIMS	crystallization age	POST-OROGENIC		188
790	43.8561	21.3037		Saudi Arabia	Arabian Shield	Haml Suite	Afif	quartz-monzonite	U-Pb	608.6±8.1	zircon	SIMS	crystallization age	POST-OROGENIC		188
791	43.1950	23.8277		Saudi Arabia	Arabian Shield	Al Khushaymiyah Suite	Afif	quartz-monzonite	U-Pb	601.2±5.2	zircon	SIMS	crystallization age	POST-OROGENIC		188
792	44.3613	24.3788		Saudi Arabia	Arabian Shield	Ar Ruwaydah Suit	Ad Dawadimi	granite	U-Pb	611±6.5	zircon	SIMS	crystallization age	POST-OROGENIC		188
793	44.6892	23.7289		Saudi Arabia	Arabian Shield	Najirah Granite	Ad Dawadimi	granite/alkali granite	U-Pb	607±7.9	zircon	SIMS	crystallization age	POST-OROGENIC		188
794	43.7863	25.1323		Saudi Arabia	Arabian Shield	Malik Granite	Ad Dawadimi	leucogranite	U-Pb	599.4±5.1	zircon	SIMS	crystallization age	EXTENSION		188
795	41.2996	27.0623		Saudi Arabia	Arabian Shield	Idah Suite	Ha’il	alkali granite	U-Pb	605.8±5.9	zircon	SIMS	crystallization age	POST-OROGENIC		188
796	35.3368	28.7423		Saudi Arabia	Arabian Shield	Al Bad Granite Suite	Midyan	alkali granite	U-Pb	597.4±4.8	zircon	SIMS	crystallization age	EXTENSION		188
797	38.3566	24.4104		Saudi Arabia	Arabian Shield	Jar-Salajah Complex	Hijaz	granodiorite	U-Pb	709.5±8.4	zircon	SIMS	crystallization age	ARC		188

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
798	38.4931	25.1915		Saudi Arabia	Arabian Shield	Mardabah Complex	Hijaz	syenite	U-Pb	525.6±4.7	zircon	SIMS	crystallization age	POST-OROGENIC		188
799	38.4121	24.2981		Saudi Arabia	Arabian Shield	Admar Suite	Hijaz	syenite	U-Pb	599.2±3.8	zircon	SIMS	crystallization age	EXTENSION		188
800	38.7527	23.7609		Saudi Arabia	Arabian Shield	Subh Suite	Hijaz	rhyolite	U-Pb	698.7±5.5	zircon	SIMS	crystallization age	ARC		188
801	38.7806	23.7452		Saudi Arabia	Arabian Shield	Shufayyah Comple	Hijaz	granodiorite/tonalite	U-Pb	715.4±3.6	zircon	SIMS	crystallization age	ARC		188
802	21.2990	29.2810	fm	Libya	Saharan	Central Syrte Basin	?	rhyolitic volcanic breccia	K-Ar	470	feldspar	?	cooling age	EXTENSION?		189
803	19.9390	28.4280	fm	Libya	Saharan	Central Syrte Basin	?	hornblende-biotite diorite	K-Ar	553	pyroxene	?	crystallization age	ARC?		189
804	22.7070	29.5630	fm	Libya	Saharan	Central Syrte Basin	?	pink muscovite granite	K-Ar	603	muscovite	?	cooling age	ARC?		189
805	22.7070	29.5630	fm	Libya	Saharan	Central Syrte Basin	?	pink muscovite granite	K-Ar	580	muscovite	?	cooling age	ARC?		189
806	21.7340	27.5080	fm	Libya	Saharan	Central Syrte Basin	?	biotite granite	K-Ar	558	WR	?	crystallization age	?		189
807	22.5650	27.6290	fm	Libya	Saharan	Central Syrte Basin	?	biotite granite	K-Ar	557	WR	?	crystallization age	?		189
808	22.0060	28.3310	fm	Libya	Saharan	Central Syrte Basin	?	andesite	K-Ar	512	WR	?	crystallization age	?		189
809	18.9470	26.2820	fm	Libya	Saharan	Central Syrte Basin	?	granite	Rb-Sr	508	biotite	isochrone	crystallization age	?		189
810	21.6660	26.7390	fm	Libya	Saharan	Central Syrte Basin	?	quartz-biotite granulite	K-Ar	535	WR	?	HT metamorphism?	METAMORPHISM		189
811	23.7850	28.6450	fm	Libya	Saharan	Central Syrte Basin	?	trachyte	K-Ar	554	WR	?	crystallization age	?		189
812	21.1680	29.1100	fm	Libya	Saharan	Central Syrte Basin	?	granite	Rb-Sr	560	WR	isochrone	crystallization age	?		189
813	17.8210	29.4260	fm	Libya	Saharan	Central Syrte Basin	?	chlorite-sericite phyllite	Rb-Sr	550	WR	isochrone	crystallization age	?		189
814	19.3140	27.5850	fm	Libya	Saharan	Central Syrte Basin	?	granite	K-Ar	501	biotite	?	crystallization age	?		189
815	22.6460	29.0570	fm	Libya	Saharan	Central Syrte Basin	?	andesite, pink	Rb-Sr	453	WR	isochrone	crystallization age	?		189
816	21.4430	29.1310	fm	Libya	Saharan	Central Syrte Basin	?	biotite granite	K-Ar	508	biotite	?	crystallization age	?		189
817	20.6730	28.3840	fm	Libya	Saharan	Central Syrte Basin	?	granite	K-Ar	450	WR	?	crystallization age	?		189
818	21.5640	29.1480	fm	Libya	Saharan	Central Syrte Basin	?	granite	K-Ar	459	biotite	?	crystallization age	?		189

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
819	21.4010	28.4190	fm	Libya	Saharan	Central Syrte Basin	?	granite	K-Ar	490	WR	?	crystallization age	?		189
820	20.7940	27.6840	fm	Libya	Saharan	Central Syrte Basin	?	diorite	K-Ar	663	WR	?	crystallization age	?		189
821	21.5170	28.4380	fm	Libya	Saharan	Central Syrte Basin	?	diorite	K-Ar	500	WR	?	crystallization age	?		189
822	21.1280	29.3170	fm	Libya	Saharan	Central Syrte Basin	?	trachyte	Rb-Sr	487	WR	isochrone	crystallization age	?		189
823	20.3500	28.0980	fm	Libya	Saharan	Central Syrte Basin	?	dacite-porohyry	K-Ar	447	feldspar	?	crystallization age	?		189
824	13.9008	28.1392	fm	Libya	Saharan	Central Syrte Basin	?	muscovite granite	Rb-Sr	595	WR	isochrone	crystallization age	?		189
825	35.4540	8.9458		Ethiopia	Arabian Nubian Shield	Didesa Domain	Ganjii granitoid	monzogranite	U-Pb	584 ± 10	zircon	SHIRIMP II	crystallization age	RIFTING		190
826	36.1551	9.0311		Ethiopia	Arabian Nubian Shield	Didesa Domain	Didesa River	K-feldspar-rich granite	U-Pb	653 ± 12	zircon	SHIRIMP II	crystallization age	SC		190
827	36.1551	9.0311		Ethiopia	Arabian Nubian Shield	Didesa Domain	Didesa River	quartzo-feldspathic gneiss	U-Pb	794 ± 30	zircon	SHIRIMP II	crystallization age	PRC		190
828	35.6250	9.1657		Ethiopia	Arabian Nubian Shield	Didesa Domain	Ethiopian Road Authority Quarry	hornblende + biotite tonalite	U-Pb	841 ± 8	zircon	SHIRIMP II	crystallization age	PRC		190
829	35.6250	9.1657		Ethiopia	Arabian Nubian Shield	Didesa Domain	Ethiopian Road Authority Quarry	felsic granite	U-Pb	827 ± 17	zircon	SHIRIMP II	crystallization age	PRC		190
830	35.4390	9.1380	fm	Ethiopia	Arabian Nubian Shield	Didesa Domain	Gneiss and migmatites	schist	Ar-Ar	551.6±2.2	muscovite	total fusion	cooling age	METAMORPHISM		191
831	38.6400	3.8270	fm	Ethiopia	Arabian–Nubian Shield	Moyale–Sololo granite-gneiss complex	Metoarbasebat granite	granite	U-Pb	526±5	zircon	SHIRIMP II	crystallization age	POST-OROGENIC		192
832	38.7750	6.1000	fm	Ethiopia	Arabian–Nubian Shield	Adola granitegneiss complex	Meleka granodiorite	granodiorite	U-Pb	560±8	zircon	SHIRIMP II	crystallization age	ARC		192
833	38.6350	5.1940	fm	Ethiopia	Arabian–Nubian Shield	Megado ophiolitic fold and thrust belt	Digati diorite gneiss	diorite gneiss	U-Pb	570±7	zircon	SHIRIMP II	crystallization age	ARC		192
834	39.2920	5.9590	fm	Ethiopia	Arabian–Nubian Shield	Adola granitegneiss complex	Wadera megacrystic diorite gneiss	diorite gneiss	U-Pb	579±5	zircon	SHIRIMP II	crystallization age	ARC		192
835	39.3630	5.9640	fm	Ethiopia	Arabian–Nubian Shield	Adola granitegneiss complex	Wadera deformed granite dyke	granite dyke	U-Pb	576±7	zircon	SHIRIMP II	crystallization age	ARC		192

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
836	39.1510	3.6330	fm	Ethiopia	Arabian–Nubian Shield	Megado ophiolitic fold and thrust belt	Moyale granodiorite	granodiorite	U-Pb	666±5	zircon	SHIRIMP II	crystallization age	ARC		192
837	39.2820	4.6750	fm	Ethiopia	Arabian–Nubian Shield	Adola granitegneiss complex	Melka Guba megacrystic diorite gneiss	diorite gneiss	U-Pb	778 ±23	zircon	SHIRIMP II	crystallization age	ARC		192
838	39.4650	4.9170	fm	Ethiopia	Arabian–Nubian Shield	Bulbul Belt	Bulbul mylonitic diorite	mylonitic diorite	U-Pb	876±7	zircon	SHIRIMP II	crystallization age	ARC		192
839	38.6400	3.8270	fm	Ethiopia	Arabian–Nubian Shield	Moyale–Sololo granite-gneiss complex	Metoarbasebat granite	granite	Ar-Ar	511±4	hornblende	Laser probe	cooling age	METAMORPHISM		192
840	38.7750	6.1000	fm	Ethiopia	Arabian–Nubian Shield	Adola granitegneiss complex	Meleka granodiorite	granodiorite	Ar-Ar	512±4	biotite	Laser probe	cooling age	METAMORPHISM		192
841	38.6350	5.1940	fm	Ethiopia	Arabian–Nubian Shield	Megado ophiolitic fold and thrust belt	Digati diorite gneiss	diorite gneiss	Ar-Ar	502±4	biotite	Laser probe	cooling age	METAMORPHISM		192
842	39.4650	4.9170	fm	Ethiopia	Arabian–Nubian Shield	Bulbul Belt	Bulbul mylonitic diorite	mylonitic diorite	Ar-Ar	495±5	biotite	Laser probe	cooling age	METAMORPHISM		192
843	39.6182	13.9456	fm	Ethiopia	Arabian–Nubian Shield	Tigrai	Tsaliet Group	sill	U-Pb	775.9±6.5	zircon	SHIRIMP RG	crystallization age	OROGENIC		192
844	38.9686	14.0497	fm	Ethiopia	Arabian–Nubian Shield	Tigrai	Mai Kenetal granite	granit	U-Pb	612.3±5.7	zircon	SHIRIMP RG	crystallization age	POST-OROGENIC		193
845	39.4153	13.8902	fm	Ethiopia	Arabian–Nubian Shield	Tigrai	Tsaliet Granitoid	aplite granite	U-Pb	784.2±14.1	zircon	SHIRIMP RG	crystallization age	OROGENIC		193
846	38.0630	14.7410	fm	Ethiopia	Arabian–Nubian Shield	Axum area	Azeho Granitoid	granitoid	Sm-Nd	763 ±24	WR	isochrone	crystallization age	SYN-OROGENIC		194
847	38.3610	14.3900	fm	Ethiopia	Arabian–Nubian Shield	Axum area	Deset Granitoid	granitoid	U-Pb	757±30	zircon	CHIME	crystallization age	SYN-OROGENIC		194
848	38.6490	14.2770	fm	Ethiopia	Arabian–Nubian Shield	Axum area	Chila Granitoid	granitoid	U-Pb	806 ±21	zircon	CHIME	crystallization age	SYN-OROGENIC		194
849	38.8060	14.3180	fm	Ethiopia	Arabian–Nubian Shield	Axum area	Rama Granitoid	granitoid	Sm-Nd	793±51	biotite-hornblende	isochrone	crystallization age	SYN-OROGENIC		194
850	39.5900	15.3110	fm	Eritrea	Arabian–Nubian Shield	Eastern Eritrea	Ghedem domain mylonites	mylonitised titanite-bearing amphibole gneisses	Ar-Ar	586 ± 6	hornblende	plateau	cooling age	METAMORPHISM		195
851	39.5840	15.3220	fm	Eritrea	Arabian–Nubian Shield	Eastern Eritrea	Ghedem domain mylonites	mylonitised titanite-bearing amphibole gneisses	Ar-Ar	565 ± 7	hornblende	plateau	cooling age	METAMORPHISM		195

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
852	39.5010	15.2880	fm	Eritrea	Arabian–Nubian Shield	Eastern Eritrea	Ghedem domain mylonites	mylonitised titanite-bearing amphibole gneisses	Ar-Ar	572 ± 7	hornblende	plateau	cooling age	METAMORPHISM		195
853	39.5160	15.2840	fm	Eritrea	Arabian–Nubian Shield	Eastern Eritrea	Ghedem domain mylonites	mylonitised titanite-bearing amphibole gneisses	Ar-Ar	579 ± 5	hornblende	plateau	cooling age	METAMORPHISM		195
854	39.3940	15.5100	fm	Eritrea	Arabian–Nubian Shield	Eastern Eritrea	Ghedem domain mylonites	mylonitised quartzo-feldspathic gneisses	Ar-Ar	563 ± 5	muscovite	plateau	cooling age	METAMORPHISM		195
855	39.5750	15.3040	fm	Eritrea	Arabian–Nubian Shield	Eastern Eritrea	Ghedem domain mylonites	mylonitised quartzo-feldspathic gneisses	Ar-Ar	576 ± 6	muscovite	plateau	cooling age	METAMORPHISM		195
856	39.4570	15.3230	fm	Eritrea	Arabian–Nubian Shield	Eastern Eritrea	Ghedem domain mylonites	mylonitised titanite-bearing amphibole gneisses	Ar-Ar	594 ± 6	hornblende	plateau	cooling age	METAMORPHISM		195
857	39.4410	15.3870	fm	Eritrea	Arabian–Nubian Shield	Eastern Eritrea	Ghedem domain mylonites	mylonitised titanite-bearing amphibole gneisses	Ar-Ar	583 ± 5	hornblende	plateau	cooling age	METAMORPHISM		195
858	39.4130	15.5120	fm	Eritrea	Arabian–Nubian Shield	Eastern Eritrea	Ghedem domain mylonites	mylonitised titanite-bearing amphibole gneisses	Ar-Ar	572 ± 6	hornblende	plateau	cooling age	METAMORPHISM		195
859	36.3506	10.6036		Ethiopia	Arabian–Nubian Shield	Kilaj–Wembera area	Kilaj	metadolerite	U-Pb	866±20	zircon	ID-TIMS (upper intercept)	crystallization age	PRE-OROGENIC		196
860	34.9011	10.6822		Ethiopia	Arabian–Nubian Shield	Kilaj–Wembera area	Duksi	granitoid	U-Pb	699±2	zircon	ID-TIMS (upper intercept)	crystallization age	SYN-OROGENIC		196
861	35.9531	10.5208		Ethiopia	Arabian–Nubian Shield	Kilaj–Wembera area	Dogi	granitoid	U-Pb	651±5	zircon	ID-TIMS (upper intercept)	crystallization age	SYN-OROGENIC		196
862	34.7970	8.1710	cop	Ethiopia	Arabian–Nubian Shield	Western Ethiopian Shield	Baro domain	orthogneiss	U-Pb	798± 12	zircon	ID-TIMS (upper intercept)	crystallization age	ARC		197
863	35.8990	9.2320	cop	Ethiopia	Arabian–Nubian Shield	Western Ethiopian Shield	Geba domain	orthogneiss	U-Pb	811 +24/−25	zircon	ID-TIMS (upper intercept)	crystallization age	ARC		197
864	39.5440	13.9390	fm	Ethiopia	Arabian–Nubian Shield	Northern Ethiopia	Negash pluton	monzogranite	U-Pb	608± 7	zircon	SIMS	crystallization age	POST-OROGENIC		198

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
865	34.8167	8.1833		Ethiopia	Arabian–Nubian Shield	Western Ethiopian Shield	Baro granite	granite	Rb-Sr	759 ± 18	WR	isochrone	crystallization age	SYN-OROGENIC		199
866	34.9333	8.1833		Ethiopia	Arabian–Nubian Shield	Western Ethiopian Shield	Birbir west	quartz diorite	U-Pb	828 +9/-2	zircon	ID-TIMS (upper intercept)	crystallization age	PRE-OROGENIC		199
867	35.0167	8.3333		Ethiopia	Arabian–Nubian Shield	Western Ethiopian Shield	Goma	granodiorite	U-Pb	814 ± 2	zircon	ID-TIMS (upper intercept)	crystallization age	PRE-OROGENIC		199
868	35.0333	8.4000		Ethiopia	Arabian–Nubian Shield	Western Ethiopian Shield	Mao	granite	U-Pb	541 +10/-16	zircon	ID-TIMS (lower intercept)	crystallization age	POST-OROGENIC		199
869	34.9000	8.2167		Ethiopia	Arabian–Nubian Shield	Western Ethiopian Shield	Bonga	quartz monzonite	U-Pb	571 +11/—3	zircon	ID-TIMS (upper intercept)	crystallization age	POST-OROGENIC		199
870	34.9333	8.1833		Ethiopia	Arabian–Nubian Shield	Western Ethiopian Shield	Birbir west	quartz diorite	Rb-Sr	632 ± 8	WR	isochrone	crystallization age	POST-OROGENIC		199
871	35.0333	8.4000		Ethiopia	Arabian–Nubian Shield	Western Ethiopian Shield	Mao	granite	Rb-Sr	552 ± 41	WR	isochrone	crystallization age	POST-OROGENIC		199
872	34.9000	8.2167		Ethiopia	Arabian–Nubian Shield	Western Ethiopian Shield	Bonga	quartz monzonite	Rb-Sr	540 ± 10	WR	isochrone	crystallization age	POST-OROGENIC		199
873	39.1042	14.2743		Ethiopia	Arabian–Nubian Shield	Northern Ethiopia	Aksum–Adigrat road	red granite	Ar-Ar	600.3±10.7	biotite	plateau	cooling age (magmatism)	OROGENIC		199
874	39.5530	13.8830	fm	Ethiopia	Arabian–Nubian Shield	Northern Ethiopia	South Adigrat	red granite	Ar-Ar	663.7±14.0	biotite	plateau	cooling age (magmatism)	OROGENIC		200
875	39.5530	13.8830	fm	Ethiopia	Arabian–Nubian Shield	Northern Ethiopia	South Adigrat	tonalite	Ar-Ar	665.8±13.0	biotite	plateau	cooling age (magmatism)	OROGENIC		200
876	39.5530	13.8830	fm	Ethiopia	Arabian–Nubian Shield	Northern Ethiopia	South Adigrat	tonalite	Ar-Ar	647.2±13.0	biotite	plateau	cooling age (magmatism)	OROGENIC		200
877	38.8101	14.3434		Ethiopia	Arabian–Nubian Shield	Western Ethiopian	North Aksum	metagranodiorite	Ar-Ar	736.6±12.8	biotite	plateau	cooling age (metamorphism)	METAMORPHISM		200
878	36.6550	10.0000	fm	Ethiopia	Arabian–Nubian Shield	Western Ethiopian	West Debre Markos	leucogranite	Ar-Ar	594.0±10.7	muscovite	plateau	cooling age (magmatism)	OROGENIC		200
879	36.4980	9.1010	fm	Ethiopia	Arabian–Nubian Shield	Western Ethiopian	North Nekemte	augen gneiss	Ar-Ar	564.5±10.2	biotite	plateau	cooling age (metamorphism)	METAMORPHISM		200
880	39.1960	5.9140	fm	Ethiopia	Arabian–Nubian Shield	Western Ethiopian	Dodola	red granite	Ar-Ar	518.3±11.5	muscovite	plateau	cooling age (magmatism)	OROGENIC		200
881	39.1480	4.7800	fm	Ethiopia	Arabian–Nubian Shield	Western Ethiopian	Dodola	granite	Ar-Ar	542.3±11.9	muscovite	plateau	cooling age (magmatism)	OROGENIC		200
882	39.9667	4.1500		Ethiopia	Arabian–Nubian Shield	Western Ethiopian	El Der	hornblende-biotite gneiss	K-Ar	739 ±14	biotite		cooling age (metamorphism)	METAMORPHISM		201
883	39.9667	4.1500		Ethiopia	Arabian–Nubian Shield	Western Ethiopian	El Der	Amphlbolite	K-Ar	637 ± 20	WR		crystallization age	OROGENIC		201
884	39.0500	3.5333		Ethiopia	Arabian–Nubian Shield	Western Ethiopian	Moyale	blotite quartz-diorite	K-Ar	517 ± 9	biotite		cooling age (magmatism)	OROGENIC		201

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
885	39.2667	4.8500		Ethiopia	Arabian–Nubian Shield	Western Ethiopian	Dawa Parma river	biotite augen-gneiss	K-Ar	607 ± 5	biotite		cooling age (metamorphism)	METAMORPHISM		201
886	39.5167	5.0667		Ethiopia	Arabian–Nubian Shield	Western Ethiopian	SW of Negheili	hornblende gneiss	K-Ar	615± 67	hornblende		cooling age (metamorphism)	METAMORPHISM		201
887	39.4500	4.9667		Ethiopia	Arabian–Nubian Shield	Western Ethiopian	SW of Negheili	hornblende-chlorlte gneiss	K-Ar	625 ± 47	hornblende		cooling age (metamorphism)	METAMORPHISM		201
888	39.4000	4.8667		Ethiopia	Arabian–Nubian Shield	Western Ethiopian	SW of Negheili	muscovite gneiss	K-Ar	492 ± 4	muscovite		cooling age (metamorphism)	METAMORPHISM		201
889	42.6500	9.2500		Ethiopia	Arabian–Nubian Shield	Western Ethiopian	E of Harar	muscovite-quartz pegmatite	K-Ar	569 ± 35	muscovite		cooling age (magmatism)	OROGENIC		201
890	39.3910	13.9350	fm	Ethiopia	Arabian–Nubian Shield	Tigrai	Hauzien Pluton	granite	Pb-Pb	613.4 ± 0.9	zircon	evaporation	crystallization age	POST-OROGENIC		202
891	39.5300	13.9200	fm	Ethiopia	Arabian–Nubian Shield	Tigrai	Negash Pluton	granodiorite	Pb-Pb	606.0 ± 0.9	zircon	evaporation	crystallization age	POST-OROGENIC		202
892	38.4030	16.6710	cop	Eritrea	Arabian–Nubian Shield	Nakfa area	Wogret granite	granite	Pb-Pb	622± 1	zircon	evaporation	crystallization age	OROGENIC		203
893	38.4570	16.6630	nc	Eritrea	Arabian–Nubian Shield	Nakfa area	Nakfa intrusives	syenite	U-Pb	628 ±4	zircon	evaporation	crystallization age	FAULTING		203
894	38.4140	16.6670	fm	Eritrea	Arabian–Nubian Shield	Nakfa area	Metasedimentary unit	metarhyolite	U-Pb	854 ±3 Ma	zircon	SHRIMP	crystallization age	ARC		204
895	37.4550	14.7680	fm	Eritrea	Arabian–Nubian Shield	Augaro Area	Dukambia Granite	granite	Pb-Pb	849±20	zircon	evaporation	crystallization age	ARC		205
896	37.3720	14.7550	fm	Eritrea	Arabian–Nubian Shield	Augaro Area	Adi Berbere Granite	granite	U-Pb	849±26	zircon	ID-TIMS (upper intercept)	crystallization age	ARC		205
897	35.6140	9.0270	fm	Ethiopia	Arabian–Nubian Shield	Wallagga area	Ganjii granitoids	monzogranite	Pb-Pb	622±7	zircon	evaporation	crystallization age	RIFTING		206
898	36.6670	9.6710	fm	Ethiopia	Arabian–Nubian Shield	Wallagga area	Guttin granitoids	K-feldspar megacrystic granite	U-Pb	730±2	zircon	ID-TIMS (concordia age)	crystallization age	OROGENIC		206
899	35.9600	9.0240	fm	Ethiopia	Arabian–Nubian Shield	Wallagga area	Suqii-Wagga granitoids	two-mica granite	Pb-Pb	698±27	zircon	evaporation	crystallization age	OROGENIC		206
900	35.7600	9.2440	fm	Ethiopia	Arabian–Nubian Shield	Wallagga area	Ujjukka granitoids	granite and granodiorite	Pb-Pb	815±5	zircon	evaporation	crystallization age	ARC		206
901	35.6140	9.0270	fm	Ethiopia	Arabian–Nubian Shield	Wallagga area	Ganjii granitoids	monzogranite	U-Pb	623±3	zircon	ID-TIMS (lower intercept)	crystallization age	RIFTING		206
902	35.4042	9.1629		Ethiopia	Western Ethiopian Shield	Ghimbi-Nedjo	Wayu Meni	olivine gabbro	U-Pb	778.1 ± 6.3	zircon	SHRIMP	crystallization age	OPHIOLITE		207
903	35.5054	9.6491		Ethiopia	Western Ethiopian Shield	Ghimbi-Nedjo	Senbet Dura	hornblende diorite	U-Pb	787.7 ± 8.8	zircon	SHRIMP	crystallization age	ARC		207

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
904	35.5722	9.5518		Ethiopia	Western Ethiopian Shield	Ghimbi-Nedjo	Gebeya Kemisa	pyroxene diorite	U-Pb	794.3 ± 9.4	zircon	SHRIMP	crystallization age	ARC		207
905	35.8084	9.4507		Ethiopia	Western Ethiopian Shield	Ghimbi-Nedjo	Kemashi	hornblende diorite	U-Pb	856.3 ± 9.8	zircon	SHRIMP	crystallization age	OPHIOLITE		207
906	35.5054	9.6491		Ethiopia	Western Ethiopian Shield	Ghimbi-Nedjo	Bikilal-Ghimbi	hornblende gabbro	U-Pb	846.0 ± 7.6	zircon	SHRIMP	crystallization age	OPHIOLITE		207
907	35.7400	9.1010	fm	Ethiopia	Arabian–Nubian Shield	Western Ethiopian Shield	Homa granitic gneisses	peralkaline granitic gneiss	U-Pb	778 ± 49	zircon	SHRIMP II	crystallization age	ARC		208
908	35.7370	9.0880	fm	Ethiopia	Arabian–Nubian Shield	Western Ethiopian Shield	Homa granitic gneisses	leucocratic granitic gneiss	U-Pb	776 ± 12	zircon	SHRIMP II	crystallization age	ARC		208
909	37.9360	14.0670	fm	Ethiopia	Western Ethiopian Shield	Tigray basement	Tsaliet and Tembien group	granite	U-Pb	627.5±1.1	zircon	ID-TIMS	crystallization age	ARC		209
910	37.9730	14.1270	fm	Ethiopia	Western Ethiopian Shield	Tigray basement	Tsaliet and Tembien group	granite	U-Pb	624.24±0.6	zircon	ID-TIMS	crystallization age	ARC		209
911	38.1670	14.1670	fm	Ethiopia	Western Ethiopian Shield	Tigray basement	Tsaliet and Tembien group	granite	U-Pb	610.7 ± 1.1	zircon	ID-TIMS	crystallization age	ARC		209
912	33.4986	18.7070		Sudan	Arabian–Nubian Shield	Bayuda Terrane	Rahaba-Absol Terrane	porphyroblastic biotite metagranite	U-Pb	815±5	zircon	LA-SF-ICP-MS	crystallization age	ARC		210
913	33.3919	18.6439		Sudan	Arabian–Nubian Shield	Bayuda Terrane	Rahaba-Absol Terrane	porphyroblastic quartzfeldspathic metagranite	U-Pb	914.1±5.5	zircon	LA-SF-ICP-MS	crystallization age	RIFTING		210
914	33.1526	18.5344		Sudan	Arabian–Nubian Shield	Bayuda Terrane	Rahaba-Absol Terrane	porphyroblastic biotite-muscovite metagranite	U-Pb	912±4	zircon	LA-SF-ICP-MS	crystallization age	RIFTING		210
915	33.4044	18.6095		Sudan	Arabian–Nubian Shield	Bayuda Terrane	Rahaba-Absol Terrane	meta-monzodiorite	U-Pb	909±9	zircon	LA-SF-ICP-MS	crystallization age	RIFTING		210
916	33.5704	18.7181		Sudan	Arabian–Nubian Shield	Bayuda Terrane	Abu Harik and Kurmut Terranes	biotite metagranite	U-Pb	794 ± 15	zircon	LA-SF-ICP-MS	crystallization age	ARC		210
917	33.5537	18.7356		Sudan	Arabian–Nubian Shield	Bayuda Terrane	Abu Harik and Kurmut Terranes	medium-grained metagranite	U-Pb	813 ± 4	zircon	LA-SF-ICP-MS	crystallization age	ARC		210
918	33.6650	18.7318		Sudan	Arabian–Nubian Shield	Bayuda Terrane	Abu Harik and Kurmut Terranes	meta-quartz-monzonite	U-Pb	810 ± 10	zircon	LA-SF-ICP-MS	crystallization age	ARC		210
919	33.6614	18.2990		Sudan	Arabian–Nubian Shield	Bayuda Terrane	Abu Harik and Kurmut Terranes	medium-grained metagranite	U-Pb	808 ± 5	zircon	LA-SF-ICP-MS	crystallization age	ARC		210
920	33.6334	18.6386		Sudan	Arabian–Nubian Shield	Bayuda Terrane	Abu Harik and Kurmut Terranes	medium-grained metagranite	U-Pb	799 ± 16	zircon	LA-SF-ICP-MS	crystallization age	ARC		210

NO	LON	LAT	ORG. *	COUNTRY	TECTONIC DIVISION	UNIT	UNIT NAME	ROCK	METHOD	AGE (Ma)	MINERAL	AGETYPE	MEANING	TECTONIC ENVIRONMENT	CROSREF	ORGREF
921	33.4863	18.5612		Sudan	Arabian–Nubian Shield	Bayuda Terrane	Abu Harik and Kurmut Terranes	biotite metagranite	U-Pb	783 ± 13	zircon	LA-SF-ICP-MS	crystallization age	ARC		210
922	33.5894	18.7427		Sudan	Arabian–Nubian Shield	Bayuda Terrane	Abu Harik and Kurmut Terranes	biotite metagranite	U-Pb	700 ± 7	zircon	LA-SF-ICP-MS	crystallization age	ARC		210
923	33.5177	18.3294		Sudan	Arabian–Nubian Shield	Bayuda Terrane	Abu Harik and Kurmut Terranes	alkali metagranite	U-Pb	645.3±5.4	zircon	LA-SF-ICP-MS	crystallization age	ARC		210
924	33.3879	18.4453		Sudan	Arabian–Nubian Shield	Bayuda Terrane	Abu Harik and Kurmut Terranes	phorphyritic meta-quartz-monzonite	U-Pb	630±4	zircon	LA-SF-ICP-MS	crystallization age	ARC		210
925	31.4140	21.6620	fm	Sudan	Arabian–Nubian Shield	Northern Sudan	Wadi Halfa	felsic metavolcanic rocks	Rb-Sr	655 ±20	WR	isochrone	crystallization age	ARC		211
926	31.3830	21.5890	fm	Sudan	Arabian–Nubian Shield	Northern Sudan	Wadi Halfa	alkali granites	Rb-Sr	530 ±10	WR	isochrone	crystallization age	RIFTING		211
927	30.9610	21.3760	fm	Sudan	Arabian–Nubian Shield	Northern Sudan	Wadi Halfa	orthogneiss	Pb-Pb	719± 14	zircon	evaporation	crystallization age	ARC		211
928	34.1660	28.6413		Egypt	Arabian–Nubian Shield	Sinai	Wadi Zaghra	diorite	U-Pb	614 ± 4	zircon	LA-ICP-MS	crystallization age	RIFTING		212
929	34.1662	28.6413		Egypt	Arabian–Nubian Shield	Sinai	Wadi Zaghra	diorite	U-Pb	631 ± 4	zircon	LA-ICP-MS	crystallization age	RIFTING		212
930	34.1807	28.6333		Egypt	Arabian–Nubian Shield	Sinai	Wadi Zaghra	mozogranite	U-Pb	605 ± 7	zircon	LA-ICP-MS	crystallization age	RIFTING		212
931	34.1764	28.6363		Egypt	Arabian–Nubian Shield	Sinai	Wadi Zaghra	granite	U-Pb	622 ± 6	zircon	LA-ICP-MS	crystallization age	RIFTING		212
932	34.0790	28.7570		Egypt	Arabian–Nubian Shield	Sinai	Sa'al volcano-sedimentary complex	ash-fall	U-Pb	1028 ± 5	zircon	SIMS	crystallization age	ARC		213
933	34.0810	28.7520		Egypt	Arabian–Nubian Shield	Sinai	Sa'al volcano-sedimentary complex	ash-fall	U-Pb	1031 ± 5	zircon	SIMS	crystallization age	ARC		213
934	34.0920	28.7370		Egypt	Arabian–Nubian Shield	Sinai	Sa'al volcano-sedimentary complex	ash-fl ow	U-Pb	1110 ± 6	zircon	SIMS	crystallization age	ARC		213
935	34.0960	28.7440		Egypt	Arabian–Nubian Shield	Sinai	Sa'al volcano-sedimentary complex	gabbro Sill	U-Pb	1017 ± 5	zircon	SIMS	crystallization age	ARC		213
936	34.2070	28.7580		Egypt	Arabian–Nubian Shield	Sinai	Sa'al volcano-sedimentary complex	quartz Monzonite	U-Pb	819 ± 4	zircon	SIMS	crystallization age	ARC		213

Unit and Unit names were directly taken from the sources, provided by authors themselves.
Gray shaded data were not taken into any concideration because of their high errorrs (>10%).
**Coordinates provided by the authors if there is no indication next to the coordinates*
cop: center of pluton (unit, formation etc.). Coordinate is taken from the center of the unit (that can be recognized in a general map) when coordinate is not provided;
fm: from map. Coordinate is extracted from rectification of the maps provided;
fl: list of the ages including coordinates provided.
Note: Although it is too small for the resolution of this study, different coordinate systems used in different countries can cause a deviation on the coordinates extracted from rectified maps (generally < 12 km).

Table S2. The rock content of the main nine accidental units of the Saharides and their brief descriptions. The data were gathered chiefly from the following: references 214, 215, 216, 217, 218, 68, 219, 220, 221, 222, 180,158, 223, 224, 225, 226, 227, 228, 229, 230, 21, 231, 232, 233, 234, 235, 236, 237, 121, 238, 18, 138, 239, 240, 95, 205, 157, 241, 242, 126, 243, 193, 122, 123, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258,156, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269. We have taken the rock descriptions in certain cases verbatim from portions of texts of the papers cited above with a view to facilitate comparison with our sources. What is not cited here is the older literature we consulted, especially in languages other than English, in cases it is superseded or just repeated by newer work.

Name	Age	Brief Description	Interpretation
I. Bayuda-Atbay Unit			
Al Hawiyah granite suite	lower Ediacaran	The exposures are undeformed, discordant plutons, which are made of monzogranite and syenogranite with transitions to alkali-feldspar granite and granodiorite. The members of the unit are Turabah granite, Layyah complex, Rahwah granite and others.	Magmatic arc
Younger granites	lower Ediacaran	Pink to red granites of lower Ediacaran age.	Magmatic arc
Fatima Group	Cryogenian	Basal polymict conglomerate overlain by a volcanic and sedimentary assemblage that includes rhyolitic breccia, tuff, and ignimbrite, basalt, arkosic sandstone, tuffaceous sandstone, shale, limestone, and conglomerate.	Forearc basin
Samd tonalite	Cryogenian	The unit is an elliptical pluton made of tonalite, which is weakly foliated and slightly metamorphosed.	Magmatic arc
Nu'man Complex	Cryogenian	Consists of biotite monzogranite and hornblende-biotite monzogranite to granodiorite orhogneiss and subordinate massive granite.	Magmatic arc
Older granites	Cryogenian	Grey grenites of Cryogenian age.	Magmatic arc
Homogar Series	Cryogenian	This is mainly made of weakly metamorphosed volcanic rocks and includes gabbro, granite and syenite intrusions. The series is more than 1 km thick. The lower age limit of the Homogar is marked by the angular unconformity between the Homogar and Nafirdeib series. It may be correlated with the Dokhan (Egypt) and the Shammer Series (Saudi Arabia)[224].	Magmatic arc
Samran Group	Tonian	Mafic to felsic lavas and volcaniclastic rocks, graywacke, polymict conglomerate, shale, siltstone, chert, marble, and quartzofeldspathic schist, mica schist, amphibole schist. Chlorite schist and subordinate interlayered sericite schist and andesitic tuff are locally common, representing fine-grained distal volcanic deposits.	Accretionary complex

Name	Age	Brief Description	Interpretation
Zibarah Group	Tonian	Massive, to well-bedded, to schistose basalt, andesite, and mafic tuffs; subordinate dacite, rhyolite, greenstone, greenschist; and schistose sedimentary rocks such as sericite-chlorite schist, chlorite schist, quartz-feldspar-sericite-chlorite schist, epidote-tremolite and actinolite-chlorite schist. Locally, the epiclastic rocks include poorly sorted, medium- to coarse-grained, cross-bedded and ripple-marked sandstone and massive graywacke containing pebbles and small cobbles of greenstone, beds of coarse-pebble to small-boulder conglomerate, and marble. The axis of the Fatima shear zone is characterized by amphibolite, quartzofeldspathic schist, and paragneiss interlayered with calc-silicate rock, marble, garnetiferous metaquartzite, and banded biotite-quartz-feldspar paragneiss. These rocks grade into migmatite adjacent to intrusion of granite gneiss. Lavas in the group are calc-alkalic and subordinate tholeiitic, and are interpreted as products of a maturing island-arc.	Accretionary complex or forearc invaded by arc
Hali Group	Tonian	Tightly folded and faulted moderately to strongly metamorphosed rocks that vary in their degree of structural alteration from phyllite to schist to granoblastic paragneiss. The protoliths are sandstone, pebble conglomerate, silststone, limestone, and subordinate volcaniclastic rocks. Much of the sequence includes greenschist-facies gray-green phyllite, slate, graywacke, feldspathic arkose, marble, and pebble-to-cobble polymict conglomerate containing clasts of quartz diorite, quartzite, chert, and phyllite.	Accretionary complex
At Ta'if Group	Tonian	Metamorphosed mafic to felsic lavas and interbedded volcaniclastic rocks, amphibolite, albite-chlorite-epidote schist, garnetiferous quartzofeldspathic schist, chlorite schist, talc-chlorite schist, quartz-mica schist, and rare calc-silicate rocks, marble, and magnetite quartzite; Massive, schistose, and, locally, banded and gneissic amphibolite are the dominant rock types, but well-layered alternations of amphibolite and quartzofeldspathic schist and metabasalt are common. Porphyritic andesitic lava, massive porphyritic rhyodacitic lava, schistose rhyolite, and dacitic metatuff are locally present. Volcaniclastic rocks include mafic-to-felsic tuff and breccia.	Magmatic Arc

Name	Age	Brief Description	Interpretation
Al Lith	Tonian	Amphibolite, amphibolite schist, quartz-rich schist, and paragneiss interlayered with orthogneiss, and appear, overall, to be a succession of metamorphosed basaltic volcanic and volcaniclastic rocks, epiclastic sedimentary rocks, and subordinate rhyolite and marble. Basaltic rocks are represented by massive to schistose, fine- to medium-grained amphibolite, epidote amphibolite, quartz amphibolite, hornblende hornfels, greenschist, and mafic paragneiss. Other rocks types are paraamphibolite, garnet-mica schist, metaandesite, metagraywacke, metamorphosed lithic, crystal, and ash-fall tuffs, minor agglomerate, hornblende schist, and hornblende gneiss, quartzo-feldspathic schist and gneiss, impure quartzite, rare magnetite-bearing quartzite, marble, and metarhyolite and rhyolite tuff. A distinctive rock type in the belt is kyanite-bearing quartz-rich metaarenite, present as andalusite-kyanite-muscovite quartzite, rutile-muscovite-kyanite quartzite, muscovite-kyanite quartzite, staurolite-biotite-albite-sericite-quartz-andalusite schist, and lazulite-andalusite quartzite. The protoliths of the sedimentary rocks were probably sandstone, shale, claystone, sandy limestone, interbedded limestone, graywacke, arkose, and pelite.	Accretionary complex with possible basalt slivers
Bidah Belt	Tonian	Greenschist to amphibolite grade shale, phyllite, phyllitic quartzite, argillite, ferruginous quartzite, marble, graywacke, and limestone.	Accretionary complex and posibbly also forearc basin
Buwwah suitecoeal with Bidah	Tonian	Plutonic rocks, which are approximately between 855-815 Ma. They include well-bedded to massive, fine-to-medium grained basaltic, andesitic, dacitic, and rhyolitic flows and tuffs, abundant volcaniclastic rocks, and significant amounts of epiclastic sedimentary rocks, and represent one or more volcanic arcs.	Magmatic arc
Hufayriyah Complex	Tonian	Irregular plutons of tonalite.	Magmatic arc
Qiya Complex	Tonian	Deformed tonalite, granodiorite, and granite.	Magmatic arc
Kamil suite	Tonian	A suite of mafic, intermediate and felsic plutonic rocks of calc-alkalic and locally trondhjemitic afifinities, including tonalite and trondhjemite, diorite and quartz diorite, lesser amounts of granodiorite and quartz monzonite, and minor monzogranite. The rocks are weaky metamorphosed and variably deformed.	Magmatic arc

Name	Age	Brief Description	Interpretation
Tsaliet Group	Tonian	In Tigre and Eritrea, it is formed of metavolcanics ranging from basalts to dacites and rhyolites with predominance of andesites, and associated sediments: greywackes, agglomerates and slates. The metasediments bear evidence of shallow water origin, ripple marks, crossbedding, sun cracks etc. In the western and southern parts of the fold belt this unit is represented mainly by sediments of pelitic and semi-pelitic nature intercalated with occasional volcanic flows of andesitic or dacitic-rhyolitic composition. These rocks contain strongly deformed bodies of early diorites and granodiorites and large late or post-tectonic (batholitic) intrusions of granites and granodiorites[215]. A synthesis of available crystallization ages (mainly zircon U-Pb and Pb-Pb) on Tsaliet arc crust shows that igneus activity occured mainly at 820-740 Ma, but older ~850 Ma arc volcanics occur in neighbouring Eritrea[138, 205, 241].	Accretionary complex invaded by arc
Tsaliet Group (volcanics)	Tonian	Andesite, lavas and tuffs, tuffaceous slates and greywackes of the Tsaliet Group.	Magmatic arc
Abu Harik Series	Tonian	They form a belt some 20 km wide striking N-NE in the southeastern part of the Bayuda area. It consists of highly metamorphosed, partly migmatised to granitised biotite-hornblende gneisses, hornblende gneisses and amphibolites with quartzite lenses[224].	Accretionary complex invaded by arc?
Rahaba Series	Tonian	They are conformably overliying the Kurmut Series and in parts infingering with this series. In the basal parts of the series, biotite and hornblende gneisses predominate with numerous amphibolite intercalations. Acidic muscovite*bearing quartz feldspar gneisses, with amphibolite intercalations in thin layers, and lenses of calc-silicate garnetiferous quartzitic mica schists and graphitic shcists, form the typical rocks of the upper parts of the Rhaba Series in the northeastern and central part of the Bayıda desert. They are generally well foliated and intensely folded. The fold axes dip west and sw in the southern, central and western parts of the Beyuda Desert, and southeast and northwest in the southern part of the area[224].	Accretionary complex invaded by arc

Name	Age	Brief Description	Interpretation
Kurmut Series	Tonian	The rocks of the Kurmut Series are exposed in the eastern and northern parts of the Bayıda area. They are well foliated and folded. The fold axes plunge to the west and southwest with north to northwest dipping axial planes in the southern two-third of the area. They plunge to the southeast and east, and northwest to to west with southwest and south dipping axial planes in the northern part. The rocks of series mainly consist of metasediments such as quartzitesites, quartzitic schists, paragneisses, mics schists, graphite schists, calc-mica schists, calc-silicate rocks and marbles with intrusions of metavolcanic rocks. Mixed metamophic rocks indicate an origin of typical sedimentation shallow epicontinental shelf areas. The degree of metamorphism of the Kurmut Series is not high as that of the ABu Harik Series[224]. Eleven zircons from the Dam Et Tor gneiss have been analyzed. Nine concordant zircons define a Concordia age at ~860 Ma[122].	Accretionary complex invaded by arc
Tambien Group	Tonian to Cryogenian?	(a) slates, chlorite and graphite phyllite, limostone, dolomite, (b) limestone with algae and oncolite. The Tambien Group of northern Ethiopia consists of an ~5km-thick mixed carbonate-siliciclactic succession. These sediments accumulated above volcanics and volcanoclastics of the Tsaliet Group. The ca. 610 Ma-aged plutons suggest a minimum age constraint on the timing of the Tambien Group deposition[255]. The easternmost Negash synclinorium is cored by a diamictite with extrabasinal clasts interpreted with diamictites of the ca. 717-662 Ma Sturtian glaciation[240, 245]. Negash diamictite and Shiraro sequence contain detrital zircons derived from underlying ∼0.85–0.74 Ga volcanics, a small number of 1.1 Ga zircons (likely inherited within the underlying arc crust) were also detected. The youngest detrital zircons in these sequences are 0.75 and 0.74 Ga[193]. Integration of available geochronological information suggests c. 775-660 Ma as a plausible constraining deposition of the prospective glacial intervals[247].	Forearc or intra-arc basin
Didikama Formation	Tonian?	Slates and dolomites. Lower member of the Tambien Group. Occurrence of evaporite pseudomorphs in lower Didikama Formation dolomite was interpretes as < 774.7 +/- 4.8 Ma[246].	Forearc or intra-arc basin

Name	Age	Brief Description	Interpretation
Nafirdeib and Odi series	Tonian?	Both series are made up of sedimentary volcanic complex. The metasedimentary volcanic rocks are of the greenschist facies with basic and ultrabasic intrusions, and calcl-alkali batholith granitoids. The Odi Series is made up of a variety of metamorhic schists, marbles, quartzites with rare intercalations of amphibolites and greenstone effusive rocks. The Nafirdeib Seris is mainly made up of basic to intermediate altered effusice rocks and tuffs with intercalating siliceous schists, marbles and graywackes. In the upper part of the series, the sedimentary rocks are more common with intercalations of tuffs and basic greenstone effusive rocks. The Odi and Nafirdeib Series are correlated with the Abu Zeran and Atalla Series in Egypt, Abu Baish Halaban and Hali Series in Saudi Arabia, Mormora and Txaliet Seris in Ethiopia. Rocks of both series aredeformed to linear folds, but the Odi Series is more intensely folded (isoclinal, often overturned folds)[224]. Ten limited number of zircons suggest ages between 840 and 880 Ma from a rhyolite at the Aquaba Pass[121].	Accretionary complex invaded by arc
Absol Series	Tonian?	Quartz mica schists, lenticular metavolcanics, thin lenses of calcsilicate schists. In the area southwest, west and northwest of Al Shireik, the upper parts of the Rhaba Series interlock with or are overlain by the qauertz micaschists, graphiste schists, manganese schists, and rare intercalations of marbles and calc-silicates schists od the Arbol Series. These metasediments contain lenticular bodies of amphibolites and hornblende gneisses, up to 1km thick, which have probably been formed from basic volcanic rocks. The predominatly clastic rocks were origanly deposited on a rise in the marginal basin and are typical, together with the volcanic rocks, of island arc facies[224]. Absol eries interfingers with gneiss-quartz-feldspathic Rhaba Sries forming the core of a syncline[253]. The medium K-granite-granodiorite in the northeastern Bayuda Desert was discordantly emplaced at 900 Ma into high-grade metamorphic schists and amphibolites of the Absol Series[122].	Accretionary complex invaded by arc
		II. Mecca-Jizan Unit	
Shayma Nasir Group	upper Ediacaran	Polymict conglomerate; basaltic, andesitic, dacitic, and rhyolitic lava, tuff, and agglomerate; and red-brown arkosic, volcaniclastic, and calcareous sandstone	Magmatic arc
Jibalah Group	upper Ediacaran	Polymict conglomerate, arkosic sandstone, siltstone, well-bedded to stromatolitic limestone, shale, rhyolite and dacite lava, breccia, and tuff, and andesite lava and tuff; red, brown, purplish brown, or variegated gray-green and red.	Arc slivers
Ediacaran rhyolite	upper Ediacaran	Rhyolite.	Pull-apart basin product
Hadb ash Sharar suite	upper Ediacaran	Granite, granodiorite, and gabbro. The suite inclıdes monzogranite, alkali-feldspar granite, aegerine-reibekite alkali granite, and samll bodies of gabbro and granodiorite.	Magmatic arc

Name	Age	Brief Description	Interpretation
Khaniq Formation	lower Ediacaran	Sequence of massive, nonmetamorphosed rhyolite, dacite, and andesite lava and subordinate tuff	Magmatic arc
Dakhbag Formation	lower Ediacaran	Purple sandstone, subordinate siltstone, and rare, possibly algal, limestone.	Forearc basin sliced by arc shaving faults
Al Junaynah Formation	lower Ediacaran	Basal polymict conglomerate overlain by arkosic sandstone, siltstone, and slate	Arc-slicing fault basin
Abbasiyah granodiorite	lower Ediacaran	Small plutons of biotite-hornblende granodiorite and minor monzogranite.	Magmatic arc
Thurayban granodiorite	lower Ediacaran	It is a complex of nested ring-dikes composed of biotite-muscovite granodiorite and inward-dipping metasedimentary and metavolcanic spta.	Magmatic arc
Wadbah suite	lower Ediacaran	Plutons of biotite-hornblende granodiorite and monzogranite and minor tonalite. It includes a pluton that discordantly cuts serpentinite schist along the Ibran shear zone, and sheared and mylonitic plutons along the Junaynah fault zone.	Magmaic arc
Younger Granites	lower Ediacaran	Younger granites in Ethiopia and Eritrea, which are mainly made of pink to red colour granites.	Magmatic arc
Buqaya and Qarnayn formations	Cryogenian	Andesitic tuffs, breccias, and massive lavas, and basaltic sills and dikes. The felsic rocks include rhyolite porphyry, dacite, trachyte flows, thickly bedded lithic, lapilli, and welded ash-flow tuffs, and volcanic conglomerate and breccia; Sedimentary rocks are conspicuous in the central and eastern parts of the Bayda group outcrop area, and consist of interbedded sandstone and shale, in beds 1 cm-30 m thick, forming sandstone-shale units up to 1000 m thick, subordinate andesitic and felsic tuff, and purple sandstone, siltstone, and polymict conglomerate containing subrounded pebbles and cobbles of mafic and felsic volcanic rocks and granite. East and southeast of Bi’r al Bayda, the formation includes as much as 8000 m of lithic arenite and siltstone well-bedded in depositional units 10-30 cm thick, pebbly, well-bedded to massive volcaniclastic rocks, and local limestone. Sedimentary structures such as cross bedding, ripples, graded bedding, and mud cracks, and load casts are common. A magnetite-rich banded-iron formation is locally present in the vicinity of Shaghab.	Forearc basin invaded by arc
Ash Sha'ib Group	Cryogenian	The rocks appear to have lower εNd(t) values than adjacent rocks, and may constitute a separate domain (sub-terrane) within the Asir terrane, referred to as the Tathlith terrane[254]. The group is mostly high-grade amphibolite and paragneiss but includes greenschist-facies volcanic and sedimentary rocks; the high-grade rocks include hornblende-quartz-feldspar granofels and paragneiss, iron-stained felsic and amphibolitic schists, amphibolite, metatuff, calc-silicate and quartzitic rocks, marble and dolomite, magnetite-bearing cordierite-pyroxene granofels, cordierite-quartz granofels, variably sericitized and chloritized quartz-feldspar granofels, and leucocratic biotite-quartz-feldspar schist and graphitic schist.	Ophirag and ocean floor turbidites in an accretionary complex

Name	Age	Brief Description	Interpretation
Atura Formation	Cryogenian	Polymict conglomerate as much as 1 km thick with boulder-, cobble-, and pebble-clasts of the underlying rocks, overlain by arkose, pebbly sandstone or diamictite, mudstone, tuff, and minor carbonate	Forearc basin fill
Hishash granite	Cryogenian	Pluton with an irregular shape made of monzogranite and subordinate granodiorite[235].	Magmatic arc
Alawah tonalite	Cryogenian	Exposes as a small tonalite pluton, which is partly covered by Quaternary alluvium and Keinozoic sedimentary and volcanic rocks.	Magmatic arc
Kawr suite	Cryogenian	It is mostly made of monzogranite, syenogranite and granodiorite, but includes a significant amount of alkali-feldspar abd reiebeckite- and aegerine-bearing alkali diorite as well as more mafic components such as diabase and gabbro.	Magmatic arc
Ibn Hasbal suite	Cryogenian	Plutons that range in composition from monzogranite, to alkali-feldspar granite, and alkali granite. It is broadly contemporary with the Kawr suite.	Magmatic arc
Ruwayhah suite	Cryogenian	An assemblage of mafic intrusions, including tonalite. Ref. 216 intreprets this unit as to be the roots of the 'Halaban arc'.	Magmatic arc
Nabitah gneiss suite	Cryogenian	Strongly deformed granitoids that has a composisiton between tonalite, granodiorite and monzogranite and include granodiorite and monzogranite gneisses. The gneisses consist of granodiorite, monzogranite and subordinate quartz diorite, tonalite, and amphibolite. Xenoliths of amphibolite and biotite schist are locally abundant.	Magmatic arc
Samran Group	Tonian	Mafic to felsic lavas and volcaniclastic rocks, graywacke, polymict conglomerate, shale, siltstone, chert, marble, and quartzofeldspathic schist, mica schist, amphibole schist. Chlorite schist and subordinate interlayered sericite schist and andesitic tuff are locally common, representing fine-grained distal volcanic deposits.	Accretionary complex
Ghamr Group	Tonian	Polymict conglomerate containing volcanic clasts supposedly derived from the Mahd group and granite clasts derived from the Ram Ram complex; coarse-grained epiclastic sandstones; rhyolite and dacite lava flows, tuffite, volcanic breccia, and conglomerate; and subordinate basalt, basaltic-andesite and andesite lava flows, breccia, and tuffite. The rocks are only moderately deformed, and stratigraphic relationships within the group are clearly evident.	Forearc invaded by arc

Name	Age	Brief Description	Interpretation
Arj and Mahd Groups	Tonian	Basaltic to andesitic lava and tuff, felsic tuff, quartz keratophyre and chert, limestone, sandstone, conglomerate, intrusive breccia , massive andesite, sandstone, siltstone, and conglomerate; A distinctive polymict diamictite 1-5 m thick composed of matrix-supported angular to subangular clasts of Dhukhr-batholith, granitic, and felsic volcanic rocks in a dark-gray, immature, arkosic matrix type is at the base of the Mahd group south of Mahd adh Dhahab; The rest of the group consists of tholeiitic to calc-alkalic basalt, basaltic andesite. They are differentiated on the source map[220] but combined here because of the map scale. The Arj group is probably the older of the two and is interpreted by ref. 220 to be unconformable beneath the Mahd group. The rocks are intruded by the Hufayriyah tonalite and Ram Ram complex, overthrust by the Bi'r Umq mafic-ultramafic complex, and yield a SHRIMP crystallization age of 775±5 Ma[126] consistent with an unreliable Rb-Sr age of 772±28 Ma obtained from Mahd group rhyolite[219] and with SHRIMP ages of 785±6 Ma, 769±6 Ma, and 749±10 Ma obtained from the Hufayriyah and Ram rocks[126]. The map unit is treated here as ~785-775 Ma. The rocks include basaltic to andesitic lava and tuff, felsic tuff, quartz keratophyre and chert, limestone, sandstone, conglomerate, intrusive breccia, massive andesite, sandstone, siltstone, and conglomerate[220, 233]. A distinctive polymict diamictite 1-5 m thick composed of matrix-supported angular to subangular clasts of Dhukhr-batholith, granitic, and felsic volcanic rocks in a dark-gray, immature, arkosic matrix type is at the base of the Mahd group south of Mahd adh Dhahab, and may be a Neoproterozoic glacial deposit[243]. The rest of the group consists of tholeiitic to calc-alkalic basalt, basaltic andesite, andesite, dacite, and rhyolite lavas and pyroclastic rocks, some of which were deposited in a subaerial environment, subordinate sandstone, siltstone, pebble conglomerate, and minor limestone. Contain host for the Jabal Sayid and Umm ad Damar volcanic-massive sulfide deposits and the Mahd adh Dhahab epithermal gold deposit.	Accretionary complex and forearc invaded by arc
Sumayir Formation	Tonian	Mafic volcanic and fine-grained sedimentary rocks intercalated with the Bi'r Umq mafic-ultramafic complex in the northeastern part of the Jiddah terrane: undivided basalt, chert, carbonate-altered mafic rocks (listwaenite), tuffite, and siltstone, and subordinate mafic-ultramafic intrusive rocks and is locally structurally intercalated with serpentinite.	Ophiolite and epi-ophiolitic oceanic distal turbidites and cherts

Name	Age	Brief Description	Interpretation
Muwayh Formation	Tonian	Interbedded basaltic, andesitic, dacitic, and rhyolitic flows and tuffs, volcaniclastic conglomerate, sandstone, quartzite, calc-silicate rock, and ironstone metamorphosed to the greenschist facies. Intermediate to mafic lavas, agglomerate, breccia, and lithic-lapilli, crystal, and ash tuffs predominate. Dacite, rhyodacite, rhyolite, and felsic tuff form subordinate interbeds in parts of the formation particularly along its western margin. Rare white, blue, gray, and pink calcite-rich marble crops out as lenses of up to 200 m thick and as discontinuous hills surrounded by sabkhah 40 km west-northwest of Al Muwayh. Fine- to medium-grained quartzite is exposed in lenses as much as 500 m long and 50 m wide in the area west of the Ash Shakhtaliyah shear zone.	Magmatic arc that invaded a melange belt
Sarjuj Formation	Tonian	Basalt and andesite flows, agglomerate, and volcanic breccia predominate. The flow rocks are mainly fine grained; porphyritic lava is rare. Agglomerate consists of andesite, basalt, and dacite fragments as much as 25 cm across in an andesitic matrix. Subordinate interbeds consist of felsic ash tuff, siltstone, and volcanic cobble-clast conglomerate, and rare flow-banded rhyolite and dacite lava.	Magmatic arc
Khadra Belt	Tonian	Andesite, dacite, pillow basalt, subordinate rhyolite, mafic and felsic tuffs, dioritic hypabyssal intrusions, polymict conglomerate with pebble to boulder clasts of plutonic as well as volcanic and sedimentary rocks, coarse-grained, pebbly volcaniclastic graywacke, siltstone, local carbonaceous siltstone, mudstone, and shale, thin ferruginous marble, and red and brown chert. South of Tathlith, adjacent to the Hamdah serpentinite, the unit contains phyllite, marble, graywacke, siltstone, greenstone, and amphibolite intermixed with blocks and lenses of serpentinite as much as 1,500 m thick. Amphibolite-grade rocks are present at contacts with granitoid intrusions and along shear zones as amphibolite, epidote-amphibole schist and gneiss, biotite schist, biotite-muscovite schist, biotite-hornblende-quartz schist, biotite gneiss, quartzofeldspathic schist, and marble. Along the Al Mulha fault zone, the rocks are granoblastic and include biotite-hornblende psammite, feldspathic psammite, biotite-hornblende schist, and pyroxene-bearing granofelses, described by ref. 221 as 'garnetiferous-pyroxene granulite'.	Accretionary complex invaded by arc
Buwwah suitecoeal with Bidah	Tonian	Plutonic rocks, which are approximately between 855-815 Ma. They include well-bedded to massive, fine-to-medium grained basaltic, andesitic, dacitic, and rhyolitic flows and tuffs, abundant volcaniclastic rocks, and significant amounts of epiclastic sedimentary rocks, and represent one or more volcanic arcs.	Magmatic arc
Shwas Belt	Tonian	Flows and pyroclastic rocks of andesitic, dacitic, and basaltic compositions, green and red, feldspathic to lithic graywacke, tuff, flat-pebble-to-boulder conglomerate, and thin gray marble. They are metallogenically significant as the host rocks for VMS base metal and gold deposits	Magmatic arc

Name	Age	Brief Description	Interpretation
Tayyah Belt	Tonian	In the southern part of the belt include basalt in Wadi Baysh, and metasedimentary rocks in the vicinity of Sabya. The Wadi Baysh basalt, the type area for the Baish group referenced in the conventional literature on the shield, consists of tholeiitic basaltic flows and spilitic pillow basalt intercalated with minor discontinuous beds of metagraywacke, metachert, schist, and marble[225]. The rocks are regionally metamorphosed to the greenschist facies and locally metamorphosed to the amphibolite facies adjacent to intrusions. highly strained and include quartz-sericite schist, quartz-biotite-sericite schist, quartz-siderite-sericite schist, quartz-calcite-sericite schist, black carbonaceous slate, red slate, quartzite, metagraywacke, marble, and locally, kyanite-topaz-lazulite gneiss and andalusite-bearing hornfels. Where less deformed, the rocks are mapped as quartzite, quartz-pebble conglomerate, argillite, limestone, dolomite, graywacke, and sparse basalt. Elsewhere, the Tayyah-belt layered rocks consist of basaltic and andesitic flow rocks, commonly as pillow lava, flow breccia, and pyroclastic rocks interbedded with dacitic pyroclastic rocks, volcaniclastic conglomerate, coarse- to fine-grained graywacke, and phyllite. The volcaniclastic rocks are commonly carbonaceous and include thin layers of dark gray or brown marble and black chert. Local exposures of dacite and rhyolite flows together with tuffs, agglomerate, and volcaniclastic sediments are present at the north end of the structural belt. Amphibolite (tya) is common on the flanks of, and as roof pendants in, the Khamis Mushayt gneiss complex and adjacent to the Yemen border, where the rock is associated with paragneiss located on the flanks of foliated Nabitah-orogeny granite domes. The rocks are intruded by the 815-795 Ma An Nimas tonalite, trondhjemite, granodiorite, diorite, gabbro, local bodies of diorite-tonalite agmatite, and amphibolite.	Accretionary complex invaded by arc
Malahah Belt	Tonian	Mafic volcanic rocks are common in the northeastern part of the belt, in the vicinity of Wadi Wassat, comprising a sequence of basaltic and andesitic flows, breccias, agglomerates, and tuffs, interbedded with volcaniclastic graywacke, sandstone, and shale. To the southwest, dacitic flows and pyroclastic rocks and diabase sills and dikes are significant components of the assemblage, and in the south felsic pyroclastic and volcaniclastic rocks, largely metamorphosed to quartzofeldspathic sericite schist and chlorite-sericite schist, interlayered with pyritic carbonaceous graywacke and phyllite are abundant. Locally the rocks form amphibolite-grade paraschist and paragneiss. The volcaniclastic beds are locally graded and probably many were deposited as turbidites. The Malahah-belt assemblage is important as the host of large massive pyrite deposits (e.g. Wadi Wassat) and polymetallic VMS deposits (e.g. Al Masane)	Accretionary complex invaded by arc

Name	Age	Brief Description	Interpretation
Bari granodiorite	Tonian	Consists of medium -to-fine-grained biotite granodiorite that locally grades to tonalite and trondhjemite.	Magmatic arc
Ram Ram Complex	Tonian	The small bimodal intrusions that consists of granodiorite, red granite, granophyre, gabbro and diorite.	Magmatic arc
Hufayriyah Complex	Tonian	Irregular plutons of tonalite.	Magmatic arc
An Nimas Complex	Tonian	Comprises tonalite, trondhjemite, granodiorite, diorite, gabbro, local bodies of diorite-tonalite agmatite and amphibolite.	Magmatic arc
Western gneiss terranes	Tonian	The continuation of Afif and Asir terranes in Yemen and made of gneisses and schists, which are cut by granitic intrusions. The Afif terrane consists of monotonous orthogeneisses of intercalated with arc-type pillow basalts, andesites and rhyolites. The Asir terrane consists of alternating belts of greenschist-grade volcanic and sedimentary rocks and high-grade gneisses[18].	Accretionary complex invaded by arc
Tsaliet Group	Tonian	Andesite, lavas and tuffs, tuffaceous slates and greywackes of the Tsaliet Group.	Accretionary complex invaded by arc
Didikama Formation	Tonian?	Slates and dolomites. Lower member of the Tambien Group. Occurrence of evaporite pseudomorphs in lower Didikama Formation dolomite was interpreted as < 774.7 +/- 4.8 Ma[246].	Forearc or intra-arc basin
Matheos Formation	Tonian?	Limestone with stromatolite dolomitic limestone, dolomite. Upper member of the Tambien Group. A section across the upper 1 km of the Tambien Group starts with the Didikama Formation at the bottom, which is extensively dolomitized and recrsytalized pale-brown carbonates interbedded with siltstones. This transititons into well-preserved limestone ribbonite (micrite with ribbon-like laminations) with molar tooth structures of the Matheos Formation[258].	Forearc or intra-arc basin
III. Nufud al- 'Urayq unit			
Abanat suite	upper Ediacaran	Alkali-rich, leucocratic, siliceous, high evolved and undeformed granites, which are generally exposed in the northern and northeastern part of the Arabian Shield.	Magmatic arc
Ediacaran rhyolite	upper Ediacaran	Rhyolite.	Pull-apart basin product
Jibalah Group	upper Ediacaran	Polymict conglomerate, arkosic sandstone, siltstone, well-bedded to stromatolitic limestone, shale, rhyolite and dacite lava, breccia, and tuff, and andesite lava and tuff; red, brown, purplish brown, or variegated gray-green and red	Arc slivers
Malik granite	upper Ediacaran	Leococratic medium-grained biotite monzogranite.	Magmatic arc
Najirah granite	upper Ediacaran	Granite ranging in composisiton from tonalite to granodiorite to monzogranite.	Magmatic arc

Name	Age	Brief Description	Interpretation
Bani Ghayy Group	lower Ediacaran	Clast-supported subangular to rounded cobble and boulder polymict conglomerate, tuffaceous graywacke sandstone and siltstone, and limestone. Conglomerate clasts are mainly locally derived from Siham-group volcanic and Siham-associated plutonic rocks, such as diorite, granodiorite, and granite, and from intraformational volcanic rocks. Sedimentary structures, including graded, cross- and planar laminated beds, are particularly common in the finer grained rocks and are interpreted as truncated Bouma cycles[227]. Thick sequences of white, gray, and brown calc-rudite, calc-arenite, oolitic limestone, stromatolitic limestone, dolomite, and calcareous sandstone and siltstone are conspicuous in several parts of the group[259]. The volcanic sequences, which are as much as 13,000 m thick[222, 231], are an assemblage of porphyritic rhyolite[17] flows, sills, and tuffs, dacite, basalt, and andesite that, chemically, resemble present-day tholeiitic, high-alumina, and alkali basalts[227] or calc-alkalic and high-K calc-alkalic lavas transitional between continental-margin arcs and island arcs[222]. Volcaniclastic rocks include welded tuff, crystal and lapilli tuff, breccia, and agglomerate that are locally interbedded with and transitional to volcanic conglomerate.	Arc slivers
Hadn Formation	lower Ediacaran	Rhyolitic to rhyodacitic ash-flow tuff, lesser amounts of massive rhyolite and rhyodacite flows, and rare dacitic, andesitic, and basaltic flows. Epiclastic rocks include arkosic sandstone and polymict conglomerate	Magmatic arc
Hibshi Formation	lower Ediacaran	Undifferentiated conglomerate, arkose, volcanic arenite, lithic graywacke, and siltstone with subordinate mafic and felsic volcanic rocks. Felsic volcanic rocks are concentrated in the central part of the basin and are characterized by dacitic and rhyolitic welded and ash-fall tuff and dacitic and andesitic flow rocks and breccia. Mafic volcanic rocks in the northeast of the Hibshi outcrops consist of andesite flows, andesite tuff and agglomerate, subordinate graywacke, and minor conglomerate	Extensional magmatic arc
Idah Suite	lower Ediacaran	Made of calc-alkalic plutons, which expose as broadly elliptical intrusions with the older rocks units and are largely undeformed, except where locally cataclased along fault zones.	Magmatic arc
Jurdawiyah Group	lower Ediacaran	Folded and cut by numerous faults; polymict conglomerate, volcanic arenite, and andesite, dacite, rhyodacite, and rhyolite flows, tuffs, and agglomerate.	Arc slivers
Syn- to post-Shammar intrusives	lower Ediacaran	Granite plutons spatially related to, and probably coeval with, rhyolite in the Shammar Group in the north-central part of the shield, including alkali-feldspar granite, alkali granite, syenogranite, monzogranite and granodiorite.	Magmatic arc
Badwah granite	lower Ediacaran	Lenticular plutons of alkali-feldspar granite.	Magmatic arc

Name	Age	Brief Description	Interpretation
Gharamil monzogranite	lower Ediacaran	Non-foliated, coarse-grained monzogranite and subsidiary biotite-rich granodiorite.	Magmatic arc
Ar Ruwaydah suite	lower Ediacaran	Consists of Khurs and Arwa granites with pale grey to white colour and absence of the tin-tungsten or niobium-lanthanum-rare-earth-element mineral occurences. The Khurs granite is leococratic monzogranite, subordinate syenogranite and biotite-muscovite aluminous granite, whereas the Arwa granite is a greyish-red porphyritic microgranite ring-dike.	Magmatic arc
Al Khushaymiyah suite	lower Ediacaran	A group of massive, relatively undeformed, circular to concentric plutons that includes granodiorite, monzogranite, syneogranite and minor gabbro and diorite.	Magmatic arc
Abbasiyah granodiorite	lower Ediacaran	Small plutons of biotite-hornblende granodiorite and minor monzogranite.	Magmatic arc
Younger Granites	lower Ediacaran	(In Ethiopia) Granite, diorite and quartz diorite.	Magmatic arc
Shammar Group	lower Ediacaran to Tonian?	Rhyolite flow rock, ignimbrite, ash flow tuff, felsic breccias, basalt, and red-brown polymict conglomerate, sandstone, and siltstone.	Extensional magmatic arc
Buqaya and Qarnayn formations	Cryogenian	Andesitic tuffs, breccias, and massive lavas, and basaltic sills and dikes. The felsic rocks include rhyolite porphyry, dacite, trachyte flows, thickly bedded lithic, lapilli, and welded ash-flow tuffs, and volcanic conglomerate and breccia; Sedimentary rocks are conspicuous in the central and eastern parts of the Bayda group outcrop area, and consist of interbedded sandstone and shale, in beds 1 cm-30 m thick, forming sandstone-shale units up to 1000 m thick, subordinate andesitic and felsic tuff, and purple sandstone, siltstone, and polymict conglomerate containing subrounded pebbles and cobbles of mafic and felsic volcanic rocks and granite. East and southeast of Bi’r al Bayda, the formation includes as much as 8000 m of lithic arenite and siltstone well-bedded in depositional units 10-30 cm thick, pebbly, well-bedded to massive volcaniclastic rocks, and local limestone. Sedimentary structures such as cross bedding, ripples, graded bedding, and mud cracks, and load casts are common. A magnetite-rich banded-iron formation is locally present in the vicinity of Shaghab.	Forearc basin invaded by arc
Laban and Kilab complexes	Cryogenian	Heterogenous assemblage of biotite quartz diorite, lesser biotite and hornblende diorite, monzogabbro, and subordinate granodiorite, monzogranite and syenogranite.	Magmatic arc
Khishaybi Suite	Cryogenian	Granite, granodiorite, tonalite and trondhjemite batholits.	Magmatic arc
Rubayq Complex	Cryogenian	Consists of strongly deformed granite and diorite exposed at the northeastern edge of the Arabian Shield. The complex includes biotite monzogranite grading to subordinate granodiorite and amphibolite-biotite diorite with abundant small mafic inclusions.	Magmatic arc

Name	Age	Brief Description	Interpretation
Al Amar Group	Cryogenian	Andesitic tuff and breccia, andesite flow rock, well-bedded andesitic and rhyolitic tuff, welded rhyolitic tuff, minor calcareous dolomite and siltstone, and pyritic chert. The higher-grade rocks are phyllite, quartz-feldspar schist, biotite-amphibole schist, calc schist, amphibolite, amphibole and garnet-bearing paragneiss, and leucocratic quartz-feldspar gneiss. In places the metamorphosed rocks have lit-par-lit intrusions of tonalite and granodiorite, and grade into orthogneiss.	Forearc basin invaded by arc
Syn- to post-Al Amar intrusives	Cryogenian	Tonalite, quartz diorite, diorite, gabbro, and minor trondhjemite.	Magmatic arc
Abu Dhira'ah and Ar Ridaniyah Formations	Cryogenian	Intercalated quartz-feldspar schist, quartz schist, graphitic biotite schist, biotite-actinolite schist, biotite-muscovite schist, and leucocratic gneiss; jasper, biotite schist, amphibole schist, and marble. skarn minerals and hosts a Zn-Sn prospect.	Accretionary complex
Hadhaq Complex	Cryogenian	Monzogranite, diorite, tonalite and granodiorite gneiss.	Magmatic arc
Ar Rika Formaiton	Cryogenian	Greenschist-facies massive andesitic flow rocks, andesitic crystal and lapilli tuff, tuffite, local dacitic flows and tuffs, and minor sandstone, rhyolite, and volcanic breccia.	Magmatic arc
Older Granites	Cryogenian	(In Ethiopia) Granodiorites and granites	Magmatic arc
Haml suite: monzogranite and granodiorite	Cryogenian to lower Ediacaran?	Undeformed granites, including monzogranite-granodiorite. Granodiorite and monzogranite contain as much as 1% accessory magnetite.	Magmatic arc
Hamls suite: Alkali-feldspar granite	Cryogenian to lower Ediacaran?	Monzogranite and syenogranite.	Magmatic arc
Mughah Complex	Tonian	Well-banded paragneiss, amphibole gneiss and schist with or without garnet, sillimanite-bearing gneiss, actinolite-hornblende schist, sericite-chlorite schist, calc-silicate quartzite, and leucocratic gneiss. Protoliths are believed to include both mafic and felsic volcanic rocks as well as sedimentary rocks	Accretionary complex with possible ridge subduction record
Banana and Sufran Formations	Tonian	The rocks are metamorphosed in the greenschist and locally amphibolite facies. Rock types include basalt, dacite, and rhyolite flows, flow breccia, and tuff, subordinate graywacke and conglomerate, and local hornblende-plagioclase paragneiss, quartz-plagioclase-biotite paragneiss, and hornblende-biotite-garnet paragneiss. Metamorphic foliation is commonly well developed but primary structures such as pillows in basalt are locally preserved	Arc massif
Dhukhr Complex	Tonian	Tonalites, granodiorites, subordinate gabbros and trondhjemites[220].	Magmatic arc
Hulayfah Group	Tonian	Greenschist-facies basalt, andesite, dacite, rhyolite, tuffs, sandstone, shale, and small lenses of limestone	Magmatic arc

Name	Age	Brief Description	Interpretation
Isamah Formation	Tonian	Basalt, andesite, and subordinate rhyolite flows, abundant felsic and mafic tuffs, commonly well bedded and cherty, and subordinate epiclastic sedimentary rocks including conglomerate, sandstone, and siltstone. The formation is notable for polymetallic and nickel-copper-bearing sulfide deposits at Nuqrah and Jabal Mardah.	Magmatic arc
Syn- to post-Isamah formation intrusives	Tonian	Plutonic rocks that intrude the Isamah Formation, which are mainly intermediate in composition and include deformed and foliates igneous rocks such as diorite, tonalite, granodiorite and some granite.	Magmatic arc
Jidh Suite	Tonian	Calc-alkalic intrusive rocks, compositionally including granodiorite, monzogranite, tonalite, diorite, and quartz diorite.	Magmatic arc
Dhiran, Nafi, and Hillit formations, Ajal Group, and Dukhnah gneiss	Tonian	Most of the rocks are amphibolite grade. Mafic granulite is locally present and other rocks are greenschist. The Dhiran formation consists of andesite and minor dacite. The Nafi formation, Hillit formation, and Dukhnah gneiss comprise chlorite schist, biotite schist, muscovite-garnet schist, quartzofeldspathic schist, amphibolite, rare calcareous beds, biotite gneiss, quartzfeldspar gneiss, and local mafic granulite. The Ajal group south of Halaban includes amphibolite, quartzofeldspathic gneiss, minor marble, and quartzite.	Accretionary complex invaded by arc
Silham Group	Tonian	Andesite, basalt, rhyolite, shale, lithic sandstone, conglomerate, quartzite, and marble. The proportions and thicknesses of these rocks vary from locality to locality.	Magmatic arc
Tamran Formation	Tonian	Greenschist-facies andesitic agglomerate and lithic tuff, dacitic lithic-lapilli tuff, dacitic crystal tuff, and tuffaceous siltstone. Minor rock types include marble units as much as 100 m thick, jasper, and magnetite-bearing quartzite.	Magmatic arc
Fuwayliq granodiorite	Tonian	A small granodiorite intrusion adjacent to the Muhayil suite.	Magmatic arc
Sarjuj Formation	Tonian	Basalt and andesite flows, agglomerate, and volcanic breccia predominate. The flow rocks are mainly fine grained; porphyritic lava is rare. Agglomerate consists of andesite, basalt, and dacite fragments as much as 25 cm across in an andesitic matrix. Subordinate interbeds consist of felsic ash tuff, siltstone, and volcanic cobble-clast conglomerate, and rare flow-banded rhyolite and dacite lava	Magmatic arc
Tays Formation and Kabid Paragneiss	Tonian	Biotite-muscovite-quartz-oligoclase/andesine-garnet-sillimanite Granoblastic pelitic gneiss, quartz-oligoclase-biotite felsic gneiss, quartz-oligoclase-microcline-muscovite metaarkose, fine-grained quartz-feldspathic schist and locally, metaconglomerate. Small lenses of marble form a minor component of the map unit. Finely crystalline andesine-hornblende-garnet amphibolite probably represents metamorphosed mafic dikes. There are inherited zircons of Archaean and Palaeoproterozoic age.	Accretionary complex
Al-Mukalla island arc	Tonian	Contains tuffs, feldspar porphyr lavas, volcanic breccias, rhyolites, basalts and quartz-feldspar porphyr dikes[18].	Magmatic arc

Name	Age	Brief Description	Interpretation
Tsaliet Group	Tonian	In Tigre and Eritrea, it is formed of metavolcanics ranging from basalts to dacites and rhyolites with predominance of andesites, and associated sediments: greywackes, agglomerates and slates. The metasediments bear evidence of shallow water origin, ripple marks, crossbedding, sun cracks etc. In the western and southern parts of the fold belt this unit is represented mainly by sediments of pelitic and semi-pelitic nature intercalated with occasional volcanic flows of andesitic or dacitic-rhyolitic composition. These rocks contain strongly deformed bodies of early diorites and granodiorites and large late or post-tectonic (batholitic) intrusions of granites and granodiorites[215]. A synthesis of available crystallization ages (mainly zircon U-Pb and Pb-Pb) on Tsaliet arc crust shows that igneus activity occured mainly at 820-740 Ma, but older ~850 Ma arc volcanics occur in neighbouring Eritrea[138, 205, 241].	Accretionary complex invaded by arc
Syn- to post-Hulayfah intrusives	Tonian - Cryogenian boundary	Consists of plutons of monzogranite, granodiorite and dorite that intrude the Hulayfah Group.	Magmatic arc
IV. Baranis Uweinat Unit			
Post-Hammamat Felsites	upper Ediacaran	Intrusion of felsite bodies, sheets, plugs and breccia. Their field relation with Younger Granites is uncertain[214]. In many places, the felsites have intrusive relations with the Hammamat sediments, and in turn were introduced by the younger granites. However, ref. 261 mention that there ise no clear field relation between the felsites and the Hammamat sediments in the north Eastern Desert. According to ref. 218, field evidence and chemistry indicate that the felsites might be directly related to or comagmatic with the younger granites. According to the limited chemistry available, the felsites are considered to include Fe-poor alkaline rhyolite and rhyodacites[262]. Their age, being post-Dokhan and is less probably less than 580 Ma[260].	Magmatic arc
Shayma Nasir Group	upper Ediacaran	Polymict conglomerate; basaltic, andesitic, dacitic, and rhyolitic lava, tuff, and agglomerate; and red-brown arkosic, volcaniclastic, and calcareous sandstone	Magmatic arc
Jibalah Group	upper Ediacaran	Polymict conglomerate, arkosic sandstone, siltstone, well-bedded to stromatolitic limestone, shale, rhyolite and dacite lava, breccia, and tuff, and andesite lava and tuff; red, brown, purplish brown, or variegated gray-green and red	Arc slivers
Radwa granite	upper Ediacaran	Circular to semi-circular plutons of alkali and alkali-feldspar granite.	Magmatic arc
Khuls granite	upper Ediacaran	The circular to elongate plutons of medium- to coarse-grained hornblende-biotite monzogranite, granodiorite, and subordinate syneogranit. The suite is lithologically similar to Admar suite, but they are younger.	Magmatic arc

Name	Age	Brief Description	Interpretation
Younger Granites	lower Ediacaran	Pink to red and form a suite of isolated plutons, which are epizonal and unfoliated, and have sharp contacts with all surrounding rock types. Equidimensional to moderately elongate bodies. Most bodies consist almost entirely of quartz, K-feldspar and sodic plagoclase. The more mafic bodies contain moderate amounts of biotite and hornlende. Can be gourped into three: (a) Group I: Most felsic and characterized by fewer mafic and more aplitic dikes than others, Very high Rb, High Y, Nb, Low Zr, Very Low Ba, Sr (b) Group II: Varied dikes, Low Sr, (c) Mostly mafic dikes, Very high Ba, High Sr, Zr, Low Rb, Y, Nb[218]. Or; Group I: less differentiated calcl-alkaline to weakline alkaline I-type granodiorite and monsogranite, Group II: normal alkaline A-type monzogranite to syenoranite, and Gpoup III: strongly alkaline A-type alkali feldspar granite[236].	Magmatic arc
Younger Gabbro	lower Ediacaran	There are at least two different gabbroic assemblages, especially in the Central Eastern Desert (metagabbros "MG" and younger gabbro "YG"), which have distinct geochemical differences between their amphiboles. The amphiboles of the MG are mainly magnesio-hornblende with subordinate actinolitic hornblende, whereas, the YG amphibolesis edenitic hornblende in composition. The A1 and Ti contents of the amphibole of the MG indicate that these rocks are subjected to low pressure metamorphism within the greenshist-amphibolite facies[234]. In terms of intrusions in Nubia, the sequence is (1) older gabbro (or metagabbro), (2) older granite, (3) younger gabbro, and (4) younger granite. The structural evolution is interpreted to be characterized by early NW-directed tranport that formed several major thrusts in the belt. This event is correlated with the main deformation event in the Eastern Desert, elsewhere known as D2. During this event the regional fabric of the Wadi Mubarak belt was wrapped around the El Umra granite complex in a west-east orientation. This event is related to the formation of the Najd Fault System[157]. Recent studies classify gabbroic rocks in to three major groups: (I) the metagabbro-diorite-tonalite association (900-800 Ma)[238, 250], (II) the ophiolitic metagabbros (780-730 Ma)[256, 257], (III) younger gabbros (655-570 Ma)[249, 248].	Ophirag and ocean floor turbidites in an accretionary complex
Habid Formation	lower Ediacaran	Nonmetamorphosed, gently dipping greywacke, siltstone, polymict conglomerate and rare tuff[229]. Cross bedding, ripple marks, and mudcracks ara common.	Forearc basin sliced by arc shaving faults
Rithmah Complex	lower Ediacaran	Small, circular and discordant plutons, some of which are layered and include quartz diorite and subordinate gabbro, granodiorite, and tonalite.	Magmatic arc
Suwaylih suite	lower Ediacaran	The undeformed circular to elongate syenitic plutons.	Magmatic arc

Name	Age	Brief Description	Interpretation
Older Granites	Cryogenian	Grey granite or older granite; are mainly represented by tonalites, monzodiorites and qz-monzodiorites, which are derived from calc-alkaline melamunious to prealuminous I-type magma and were emplaced under prevailing compressional regime[237]. The age determined for older granodiorite is 652.5+/-2.6 Ma[123].	Magmatic arc
Metasediments	Cryogenian	A three-fold stratigraphy is preserved in the basement of the Central Eastern Desert of Egypt. A basal section of oceanic crust includes ultramafics, gabbros and pillowed basalts. These older metavolcanics are conformably suceeded by dominantly andesitic, calc-alkaline suquence of younger volcanics. The OMV and YMV are largely restricted to the the Central Eastern Desert, but analogous terranes are found in northern Arabia[68].	Accretionary complex invaded by arc
Metavolcanics	Cryogenian	Intermediate to felsic metavolcanics and metapyroclastics, which partly includes ophiolitic basic metavolcanics in places.	Magmatic arc
Al-Ays Group	Cryogenian	Basaltic to rhyolitic flows, breccias, and tuffs, and an abundance of well-bedded volcaniclastic and epiclastic sedimentary rocks. Marble is locally present. Sedimentary structures, including ripple marks and grading, are locally present. The rocks are polydeformed and metamorphosed in the greenschist facies.	Forearc close to the arc axis
Thalbah Group	Cryogenian	Pebble to cobble polymict conglomerate at the base and higher in the succession, well-bedded purple and green lithic arenite and siltstone. The clasts are derived from the underlying terrane-forming rocks of the Midyan terrane	Either part of a forearc or Post-amalgamation sedimentary basin (?pull-apart)
Zaam Group	Cryogenian	Crudely bedded to massive and pillowed basalt and andesite, mafic tuff and agglomerate, dacitic and rhyolitic flows and tuffs, massive to well bedded volcaniclastic sandstone or lithic arenite, siltstone, shale, pyritic and graphitic shale, black chert, and minor limestoneand marble. Graded bedding, load casts, and slump structures are common. A distinctive rock type is diamictite composed of small angular fragments of quartz and feldspar, isolated well-rounded pebbles, cobbles, and boulders of sandstone, rhyolite, limestone, and granite, and rafts up to several tens of meters across of sandstone, limestone and limestone breccia floating in massive argillaceous sediment. The formation is between 1000 m and 4500 m thick.	Accretionary complex invaded by arc
Hadiyah Group	Cryogenian	2000 m of massive to pillowed andesitic and basaltic lava, subordinate volcanic sandstone, fine-grained volcanic breccia and conglomerate, and minor felsic tuff, overlain by 3000 m of matrix-supported sandstone (diamictite), medium- to thin-bedded sandstone, and minor limestone that passes up into red and maroon sandstone and siltstone, greenish sandstone and siltstone, and, at the top, 2000 m of polymict conglomerate, gray to red arkosic sandstone, volcanic sandstone, and red siltstone and mudstone. Contacts are sharp to gradational	Magmatic arc

Name	Age	Brief Description	Interpretation
Furayh Group	Cryogenian	In the east, the group includes as much as 6000 m of green and purple shale, siltstone, volcaniclastic sandstone, graywacke, and subordinate limestone; cobble to boulder polymict conglomerate containing clasts of granophyre, siltstone, chert, andesite, and quartz; rhyolite, andesite, and dacite flows, and rhyolite breccia, tuff, and ignimbrite. West of Harrat Rahat, volcanic rocks are more abundant and the group contains several thousand meters of andesite and basalt flows, breccia, and tuffs, subordinate dacite and rhyolite, and interbeds of sandstone and local conglomerate.	Forearc basin invaded by arc
Admar suite	Cryogenian	Consists of a cluster of small to large, irregular- to subcircular-shaped granitoid instrusions, including granophyre, monzogranite, syenogranite, granodiorite, and subordinate tonalite and alkali-feldspar granite.	Magmatic arc
Shufayyah Complex	Cryogenian	The complex includes granodiorite, tonalite, diorite and gabbro.	Magmatic arc
Subh suite	Cryogenian	They are similar to Radwa granite, but differs in its irregular form.	Magmatic arc
Khanzirah complex	Cryogenian	Made of biotite-muscovite monzogranite and granophyre that also include monzogranite and syenogranite.	Magmatic arc
Medium to High Grade Metamorphics	Tonian	In various places, medimum-to-high grade metamorphics may include (a) biotite gneisses, diopside-hornblende gneisses, meta-quartzires, noritic to granulitic gneisses, garnet-granulitic gneisses, calc-silicates (Jebel Uweinat)[217], (b) blastomylonites (SE of Jebel Uweinat)[263], (c) granitic gneisses, often migmatitic, amphibolites, diopside-hornblende gneisses, ana tectic granitoids (SE of Jebel Uweinat)[217], (d) (Granoblastite Formation) gneissic granuluites and granoblastites, meta-quartzites, serpentinites, amphibolites, pyroxenites, metagabbro norites (western part of Jebel Kamil, east of Jebel Uweinat and around Jebel Kissu)[180, 228], (e) (Anatextite Formation) migmatic gneisses, metatxites, nebulitic diatexites, marbles, calc-silicates, amphibolites (east of Jebel Kamil)[180, 228], (f) hornblende gneisses, biotite gneisses, etc (NW Sudan)[180, 228], (g) granitic to tonalitic gneisses, often migmatized, amphibolites, marbles, calc-silicates (all areas in S Egypt and N Sudan)[223, 264] (from ref. 158). Samples from Gebel El Asr and Gebel Kamil (gabbroic anothosite and anorthosite, respectively) are fine-to-medium grained, weakly banded and exhibit well developed granoblastic texture[52].	Accretionary complex invaded by arc

Name	Age	Brief Description	Interpretation
Serpentinite	Tonian	Ophiolitic serpentinite, talc carbonate & related rocks; The Wadi-Semna serpentinites are composed essentially or antigorite, chrysotile, and lizardite, with minor carbonate, chromite, magnetite, magnesite and chlorite, and they were tectonically emplaced. Major-element compositions indicate that except, for the addition of water, the serpentinites have not been experienced extensive element mobility; these were originally CaO- and Al_2O_3-depleted harzburgites similar to peridotites from modern oceanic forearcs[12].	Accretionary complex
Milhah Formation	Tonian	Massive basalt, subordinate rhyolite subvolcanic intrusions, sandstone, shale, conglomerate, mafic tuff, and minor limestone	Magmatic arc or possibly ocean floor in accretionary complex
Birak Group	Tonian	Greenschist-facies basaltic, andesitic, dacitic, and rhyolitic flows and pyroclastic rocks (agglomerate, lapilli tuff, and ash tuff), graywacke, marble, quartzite, and chert. In places, the rocks are schistose. Chert is thinly bedded to finely laminated. White to banded pale gray and white marble is conspicuous at Jabal Farasan.	Accretionary complex invaded by arc
Al Qunnah Formation	Tonian	Andesite, basalt, rhyolite, shale, lithic sandstone, conglomerate, quartzite, and marble. The proportions and thicknesses of these rocks vary from locality to locality	Immature magmatic arc
Metagabbro-Metadiorite Complex	Tonian to Cryogenian?	In south Sinai, on the basis of petrography and mineral chemistry, three are three rock types: (1) pyroxene hornblende gabbros, (2) hornblende gabbros, and (3 diorites). The bulk-rock chemistry and the microprobe analyses of pyroxenes reveal a subalkaline magma generated in an island arc environment for the present metagabbro-diorite complex. K-Ar age dating of the hornblendes and biotites yield 794 ±30 - 667±25 Ma age[238].	Accretionary complex
Nafirdeib and Odi series	Tonian?	Both series are made up of sedimentary volcanic complex. The metasedimentary volcanic rocks are of the greenschist facies with basic and ultrabasic intrusions, and calcl-alkali batholith granitoids. The Odi Series is made up of a variety of metamorhic schists, marbles, quartzites with rare intercalations of amphibolites and greenstone effusive rocks. The Nafirdeib Seris is mainly made up of basic to intermediate altered effusice rocks and tuffs with intercalating siliceous schists, marbles and graywackes. In the upper part of the series, the sedimentary rocks are more common with intercalations of tuffs and basic greenstone effusive rocks. The Odi and Nafirdeib Series are correlated with the Abu Zeran and Atalla Series in Egypt, Abu Baish Halaban and Hali Series in Saudi Arabia, Mormora and Txaliet Seris in Ethiopia. Rocks of both series aredeformed to linear folds, but the Odi Series is more intensely folded (isoclinal, often overturned folds)[224]. Ten limited number of zircons suggest ages between 840 and 880 Ma from a rhyolite at the Aquaba Pass[121].	Accretionary complex invaded by arc

Name	Age	Brief Description	Interpretation
IVa. Tibesti Unit			
Super Tibestian Magmatic Series	upper Ediacaran	The Super Tlbestian magmatic Series includes batholithic calc-alkalic and syntectonic gabbro to granites in the Jabal Eghei area, at other locations in the eastem Tibesti area, and in the Bin Ghanimah batholith. The SuperTibestianmagmatic series intrudes the Lower Tibestian series in the eastern Tibestis (Jabal Eghei area and rocks in the southeast of the Tibesti massil) and the Upper Tibestian series in the western Tibestis (Bin Ghanimah batholith). The Super Tibestian magmatic series of the Jabal Eghei area becomes more siliceous toward the East. The Bin Ghanimah batholith becomes more siliceous towards the west. All suites contain typically calcalkalic mineralogy [21].	Magmatic arc
Upper Tibestian Metamorphic Series	Cryogenian	The Upper Tibestian Series consists of low greenschist-facies sliceaous schists and quartzites with conglomerates, interbedded greywackes and arkoses, and interbeds of rhyolitic lavas with schists. The Upper Tibestian Series extends west across the entire Tibestimassifto the Bin Ghanimah batholith[21].	Accretionary complex invaded by arc
Lower Tibestian Metamorphic Series	Tonian?	The Lower Tibestian Metamorphic Series is exposed along the eastern part of the Tibesti Massif. It contains highly metamorphosed sedimentary and intercalated basic volcanics rocks in upper greenschist to lower almandine amphibolite facies. An abundance of basic metavolcanics causes Lower Tibestian series to have a higher magnetic intensity than the Upper Tibestian Series. Major rock types include: gneisses, amphibolites, mica-schists, staurolite-garnet-mica-shcists, and hornblende-mica-schists, graphite schists and calc-silicates and marbles. The amphibolites are probably masic metavolcanic rocks. Serpentinites occur partly as small pods as veins within epidote boudins in metavolcanics, which may represent oceanic crust. Carbonate rocks occur to the west and are interbanded with mica schist and pyroclastics. Metaconglomerates at the top of the Lower Tibestian Series contain cobbles of granite, amphibolite, quartzite, gneiss and rhyolite[21].	Accretionary complex invaded by arc
IVb.			
Upper Tibestian Metamorphic Series	Cryogenian	The Upper Tibestian Series consists of low greenschist-facies sliceaous schists and quartzites with conglomerates, interbedded greywackes and arkoses, and interbeds of rhyolitic lavas with schists.	Accretionary complex invaded by arc
V. Midian-Liya unit			
Ediacaran rhyolite	upper Ediacaran	Rhyolite.	Pull-apart basin product
Jibalah Group	upper Ediacaran	Polymict conglomerate, arkosic sandstone, siltstone, well-bedded to stromatolitic limestone, shale, rhyolite and dacite lava, breccia, and tuff, and andesite lava and tuff; red, brown, purplish brown, or variegated gray-green and red	Arc slivers

Name	Age	Brief Description	Interpretation
Younger Granites	lower Ediacaran	(In Egypt) Pink to red and form a suite of isolated plutons, which are epizonal and unfoliated, and have sharp contacts with all surrounding rock types. Equidimensional to moderately elongate bodies. Most bodies consist almost entirely of quartz, K-feldspar and sodic plagoclase. The more mafic bodies contain moderate amounts of biotite and hornlende. Can be gourped into three: (a) Group I: Most felsic and characterized by fewer mafic and more aplitic dikes than others, Very high Rb, High Y, Nb, Low Zr, Very Low Ba, Sr (b) Group II: Varied dikes, Low Sr, (c) Mostly mafic dikes, Very high Ba, High Sr, Zr, Low Rb, Y, Nb[218]. Or; Group I: less differentiated calcl-alkaline to weakline alkaline I-type granodiorite and monsogranite, Group II: normal alkaline A-type monzogranite to syenoranite, and Gpoup III: strongly alkaline A-type alkali feldspar granite[236].	Accretionary complex invaded by arc
Dokhan volcanics	lower Ediacaran	The major and trace elements of lavas from Wadi Um Sidra and Um Asmer suggest from medium- to high-K basalt to rhyolite. They comprise voluminous medium- to high-K calc-alkaline lavas, subordinate adakitic lavas and minor alkali basalts (242).	Magmatic arc
Hammamat Clastics	lower Ediacaran	Made of Shihimiya and Igla formations. Dark greywackes, coarse comglomerates, green-grey siltstones, minor subgreywacke and conglomerates, purple hematitic siltstone, subgreywacke, mnor arenite, conglomerate and intraformational breccia (from up to the buttom). Hematites, rich in Igla Formayion, are most probably related to the older volcanics (Dokhan volcanics) that are exceptionally rich in iron[214]. Sediments are derived from 30% mafix rocks, 25%granodiorite, 25% intermediate volcanic rocks and 20% felsic volcanic rocks; but at Wadi Bali it is 90% internediate and 10% felsic volcanic rocks[239].	Forearc or intra-arc basin
Katherine Ring Complex	lower Ediacaran	The complex includes Katherina volcanics, subvolcanic bodies, ring dykes and granitic pluton. The Katherina volcanics are essentially composed of rhyolites, ignimbrite, volcanic breccia and tuffs. Mineralogically, the prealkaline rhyolites contain sodic amphiboles and aegirine[252].	Magmatic arc
Hinshan Formation	Cryogenian	Intermediate to felsic volcanic and sedimentary rocks, metamorphosed to the greenschist facies, and includes andesitic lava and tuffs, rhyolitic flow rock and welded tuff, subordinate basalt, and well-bedded and locally graded wacke, siltstone, and shale.	Magmatic arc
Qazaz granite super suite	Cryogenian	Predominantly monzogranite, but individual plutons also contain granodiorite, diorite, syneogranite and local gabbro.	Magmatic arc
Muwaylih Suite	Cryogenian	Mafic plutons that intrude into the granodiorites. They are variably deformed and metamorphosed. The main rock types are tonalite, trondhjemite, diorite, quartz diorite, gabbro and norite. Granodiorite, monzogranite, and serpentinite are locally present.	Magmatic arc
Zaytah Formation	Cryogenian	Conglomerate and sedimentary breccia, immature sandstone, graywacke, siltstone, shale and minor amounts of quartzite. Subordinate lithologies, mainly developed toward the top of the succession, include andesite, felsic tuff, and porphyritic felsite.	Forearc basin fill later invaded by arc

Name	Age	Brief Description	Interpretation
Bayda Group	Cryogenian	Andesitic tuffs, breccias, and massive lavas, and basaltic sills and dikes. The felsic rocks include rhyolite porphyry, dacite, trachyte flows, thickly bedded lithic, lapilli, and welded ash-flow tuffs, and volcanic conglomerate and breccia; Sedimentary rocks are conspicuous in the central and eastern parts of the Bayda group outcrop area, and consist of interbedded sandstone and shale, in beds 1 cm-30 m thick, forming sandstone-shale units up to 1000 m thick, subordinate andesitic and felsic tuff, and purple sandstone, siltstone, and polymict conglomerate containing subrounded pebbles and cobbles of mafic and felsic volcanic rocks and granite. East and southeast of Bi'r al Bayda, the formation includes as much as 8000 m of lithic arenite and siltstone well-bedded in depositional units 10-30 cm thick, pebbly, well-bedded to massive volcaniclastic rocks, and local limestone. Sedimentary structures such as cross bedding, ripples, graded bedding, and mud cracks, and load casts are common. A magnetite-rich banded-iron formation is locally present in the vicinity of Shaghab.	Magmatic arc and forearc
Older Granites	Cryogenian	(In Egypt) Grey granite or older granite; are mainly represented by tonalites, monzodiorites and qz-monzodiorites, which are derived from calc-alkaline melamunious to prealuminous I-type magma and were emplaced under prevailing compressional regime[237]. The age determined for older granodiorite is 652.5+/-2.6 Ma[123].	Magmatic arc
Metavolcanics	Cryogenian	Made of intermediate to felsic metavolcanics and metapyroclastics	Magmatic arc
Metasediments	Cryogenian	A three-fold stratigraphy is preserved in the basement of the Central Eastern Desert of Egypt. A basal section of oceanic crust includes ultramafics, gabbros and pillowed basalts. These older meta-volcanics are conformably suceeded by dominantly andesitic, calc-alkaline suquence of younger volcanics. The OMV and YMV are largely restricted to the the Central Eastern Desert, but analogous terranes are found in northern Arabia[68].	Accretionary complex invaded by arc
Al Bad granite super suite	Cryogenian to lower Ediacaran?	Granites, syenogranites and alkali-feldspar granite compositions, and high topographic relief.	Magmatic arc
Hegaf Formation	Tonian	Rocks are folded and faulted, locally strongly, and are metamorphosed to the greenschist, and locally higher, facies represented by amphibolite, mafic schist, quartz-feldspathic mica schist, and calc-silicate rock. Pillow basalt is abundant in the eastern exposures and a minor iron formation occurs in the south	Accretionary complex
Hegaf Formation	Tonian	Rocks are folded and faulted, locally strongly, and are metamorphosed to the greenschist, and locally higher, facies represented by amphibolite, mafic schist, quartz-feldspathic mica schist, and calc-silicate rock. Pillow basalt is abundant in the eastern exposures and a minor iron formation occurs in the south.	Accretionary complex

Name	Age	Brief Description	Interpretation
Silasia Formation	Tonian	Tuffaceous sedimentary rocks and tuffs at the base; an intermediate unit of jaspilitic iron formation and ferruginous tuffs; and an upper sequence of tuffs, tuffite, and tuffaceous sedimentary rocks. The formation is intruded by subconcordant sills of metadiabase as much as 100 m thick and several kilometers long.	Forearc basin fill
Ghawjah Formation	Tonian	Massive porphyritic andesitic flows with interbeds of dacite, thin felsic tuffs and quartz latite, and wacke. Basaltic and andesitic breccia and agglomerate are subordinate. Layering and graded bedding in the wacke are well preserved although metamorphism has destroyed many diagnostic volcanic features. The rocks are metamorphosed to the greenschist facies, locally to amphibolite facies and, adjacent to some faults, are strongly foliated biotite-chlorite schist.	Magmatic arc
Najah granodiorite	Tonian	Light to dark grey, uniformly medium grained granodiorites with well-developed hypidiomorphic-granular texture that is locally schictose and gneissic.	Magmatic arc
Medium to High Grade Metamorphics	Tonian	Mostly melanocratic medium to high grade metamorphic rocks; the age represents the exhumation[82]. Emplacement age for the orthogneisses change between 650 and 700 Ma[95]. In places it is also possible to see leucrocratic metamorphics.	Accretionary complex invaded by arc
Metagabbro-Metadiorite Complex	Tonian to Cryogenian?	In south Sinai, on the basis of petrography and mineral chemistry, three are three rock types: (1) pyroxene hornblende gabbros, (2) hornblende gabbros, and (3 diorites). The bulk-rock chemistry and the microprobe analyses of pyroxenes reveal a subalkaline magma generated in an island arc environment for the present metagabbro-diorite complex. K-Ar age dating of the hornblendes and biotites yield 794 ±30 - 667±25 Ma age[238].	Accretionary complex
VI. Tadrart Unit			
Ediacaran metamorphics	lower Ediacaran	Protolith is the Ediacaran sediments; amphibolite and green-schish facies. In the Djanet 'Terrane' it is in greenschists-facies sedimetary sequence (the Djanet Group), whereas it is made of amphibolite facies in Edembo 'Terrane'. In Edembo, we observe lithologies including biotite micaschists, metagreywacke with pebbles, phlogopite marble, hornblende metabasalt, and migmatitic gneiss; garnet is abundant in many lithologies. The Djanet Group is mainly a clastic series, comprising slates, quartzites, and conglomerates interleaved with decimeter to meter thick sills of pyroxene-amphibole andesite and minor amounts of more acid compositions, up to rhyolite. These sills are often boudinaged within the sedimentary sequence. Zircon Pb ages suggest ~590 Ma for the deposition and metamorphism of the Djanet Group[154].	Accretionary complex invaded by arc
Ediacaran sediments	lower Ediacaran	See the protolith content for the Ediacaran metamorphics	Accretionary complex

Name	Age	Brief Description	Interpretation
Ediacaran magmatics	lower Ediacaran	Porphyritic granite, syeno-granite, rhyolite dyke	Magmatic arc
		VII. Aïr-Biu Unit	
Ediacaran alkaline and alkali-calcic magmatics	upper Ediacaran	This composite group comprises the pate post-collisional alkali-calcic and alkaline plutons, dykes and volcanic rocks (570-520 Ma) of the Adrar des Iforas, the Tapurirt province in LATEA and in adjacent 'terranes' to the west and additional more isolated bodies such as the Tisselliline pluton in NE LATEA or the Tin Bedjane pluton and associated Tin Amali dyke swarm in Eastern Ahaggar[10].	Magmatic arc
Ediacaran magmatics	lower Ediacaran	Adamellite, granodiorite, monzogranite	Magmatic arc
Ediacaran sediments	lower Ediacaran	See the protolith content for the Ediacaran metamorphics. In the south, there is a lower Ediacaran eclogite (see ref. 5)	Accretionary complex
Older granites	lower Ediacaran-Cryogenian?	(In Nigeria); They range widerly in age and composition. But many geochronological constraints suggest early Ediacaran for the emplacement of the Older Granites. Their composition ranges from tonalites and diorites through granodiorites to true granites and syenites[251]. One sample dated as Tonian (793 Ma)[66].	Magmatic arc
Cryogenian volcano-sedimentary rocks	Cryogenian	Greenschicst facies volcano-sedimentary rocks	Accretionary complex invaded by arc
Karaukarau Schist Belt	Pan-African?	(In Nigeria) Mainly muscovite and muscovite-biotite schists interbedded with thin quartzites. Pelitic rocks include minor graphitic and feldspathic schists and contain frequent quartz and quartz-tourmaline veins. Interbedded quartzites are commonly thin but they may be grouped into sections with quartzite beds several tens of metres thick. Anthophyllite cordierite schists may have formed from rocks fed by ultramafics. Amphibolites form discontinuous bands but are not abundant. The original lithologies are muds and sands. Likel a turbidite section. The age of the lot is estimated to be Pan-African.	Accretionary complex
Kazaure Forearc Basin	Pan-African?	(In Nigeria) Dominated by massive quartzites associated with schists and metaconglomerates in the north. May be deposited in a littoral or even continental environment. Has no igneous rocks intruding it and its deformation is characterised mostly by open folds. It is estimated that its age is Pan-African. Most likely a forearc basin.	Forearc basin

Name	Age	Brief Description	Interpretation
		VIII. Pharusian Unit	
Ediacaran alkaline and alkali-calcic magmatics	upper Ediacaran	This composite group comprises the pate post-collisional alkali-calcic and alkaline plutons, dykes and volcanic rocks (570-520 Ma) of the Adrar des Iforas, the Tapurirt province in LATEA and in adjacent 'terranes' to the west and additional more isolated bodies such as the Tisselliline pluton in NE LATEA or the Tin Bedjane pluton and associated Tin Amali dyke swarm in Eastern Ahaggar[10].	Magmatic arc
Anka Shist Belt	upper Ediacaran	Metaconglomerates, sandstones, slates, phyllites, and felsic volcanic rocks. Conglomerates may locally reach thicnsesses of some 150 to 250 m, but they do not persist laterally and are replaced by feldspathic metasand tones. The conglomerates contain pebbles of granite, quartzite, phyllite and volcanic rocks. The are clearly channels draning a volcanic arc to the east of the main belt green and purple grits are interbedded with shales and siltstones ith fine cross-bedding and ripple marks. In the western part of the belt phyllites dominate ith some metasiltstones and metasandstones with rhyolitic to dacitic volcanic rocks. The metamorphic mafic and ultramafic rocks are considered older than 1 Ga which is entirely probable representing ocean floor (see ref. 265). The associated amphibolites are tholeiitic in composition. The unmetamorphosed volcanic and sedimentary rocks are dated at 516±20 Ma. There are eclogite lenses of Lower Edicaran age[5].	Accretionary complex
Ediacaran magmatics	lower Ediacaran	Granodiorite, granite	Magmatic arc
Older granites	lower Ediacaran-Cryogenian?	(In Nigeria); They range widerly in age and composition. But many geochronological constraints suggest early Ediacaran for the emplacement of the Older Granites. Their composition ranges from tonalites and diorites through granodiorites to true granites and syenites [251].	Magmatic arc
Cryogenian magmatics	Cryogenian	quartz–syenite	Magmatic arc
Cryogenian volcano-sedimentary rocks	Cryogenian	Greenschicst facies volcano-sedimentary rocks	Accretionary complex invaded by arc
Tonian magmatics	Tonian	granite, q-diorite (870-830 Ma)[266].	Magmatic arc
Tonian volcano-sedimentary rocks	Tonian		Accretionary complex invaded by arc

Name	Age	Brief Description	Interpretation
Maru Schist Belt	Tonian?	Pelitic rocks dominate, mainly as phyllites and slatesinterlyamlinatedw ith siltstones. Banded iron formation containing magnetie, haematite and garnet is also present indicating deep-water deposition. Impure micaceous quartzites occur near the eastern margin of the belt. Mafic rocks represented by amphibolites are present in several localities. The whole thing is intruded by granites, granodiorites and syenites.	Accretionary complex invaded by arc?
		IX. Iforas Unit	
Edacaran alkaline and alkali-calcic magmatics	upper Ediacaran	This composite group comprises the pate post-collisional alkali-calcic and alkaline plutons, dykes and volcanic rocks (570-520 Ma) of the Adrar des Iforas, the Tapurirt province in LATEA and in adjacent 'terranes' to the west and additional more isolated bodies such as the Tisselliline pluton in NE LATEA or the Tin Bedjane pluton and associated Tin Amali dyke swarm in Eastern Ahaggar[10].	Magmatic arc
Ediacaran magmatics	lower Ediacaran	Granodiorite, alkaline granite, rhyolitic lavas, monzogranite, tonalite, and q-monzogranite	Magmatic arc
Ediacaran sediments	lower Ediacaran	See the protolith content for the Ediacaran metamorphics. Unit includs eclogite lenses (~623 Ma)[5].	Accretionary complex
Cryogenian magmatics	Cryogenian	plagiogranite, orthogneiss, granodiorite, diorite	Magmatic arc
Cryogenian volcano-sedimentary rocks	Cryogenian	Greenschicst facies volcano-sedimentary rocks	Accretionary complex invaded by arc
Tonian volcano-sedimentary rocks	Tonian	q-diorite, orthogneiss,	Accretionary complex invaded by arc
		IXa. Tassendjanet Unit	
Ediacaran magmatics	lower Ediacaran	Gabbro and granite[146].	Magmatic arc
Ediacaran sediments	lower Ediacaran	See the protolith content for the Ediacaran metamorphics	Accretionary complex
Cryogenian volcano-sedimentary rocks	Cryogenian	Greenschicst facies volcano-sedimentary rocks	Accretionary complex invaded by arc
Tonian volcano-sedimentary rocks	Tonian	It is mainly composed of a huge monotonous formation of turbiditic greywackes and con-glomerates formed by the erosion of calc-alkaline lavas and plutonsranging from basaltic andesites to dacites in composition5, [267, 268] and overlying volcanic and volcanoclastics (<680 Ma)[269].	Accretionary complex invaded by arc
		IXb. Tilemsi Unit	
Cryogenian magmatics	Cryogenian	Plagiogranite, orthogneiss, granodiorite, and diorite	Magmatic arc

Name	Age	Brief Description	Interpretation
Cryogenian volcano-sedimentary rocks	Cryogenian	Greenschicst facies volcano-sedimentary rocks with eclogite	Accretionary complex invaded by arc
Tonian magmatics	Tonian	Q-diorite, and orthogneiss	Magmatic arc
Tonian sediments	Tonian	metaabasalts, acid metavolcanics, and mafic dyke complexe	Accretionary complex

SI References

1. Cottin, J. Y., Lorand, J. P., Agrinier, P., Bodinier, J. L., & Liégeois, J. P., 1998, Isotopic (O, Sr, Nd) and trace element geochemistry of the Laouni layered intrusions (Pan-African belt, Hoggar, Algeria): evidence for post-collisional continental tholeiitic magmas variably contaminated by continental crust. Lithos, 45(1-4), 197-222.

2. Ait-Djafer, S., Ouzegane, K., Paul-Liégeois, J., & Kienast, J. R., 2003, An example of post-collisional mafic magmatism: the gabbro–anorthosite layered complex from the Tin Zebane area (western Hoggar, Algeria). Journal of African Earth Sciences, 37(3-4), 313-330.

3. Liégeois, J.P., Latouche, L., Boughrara, M., Navez, J. and Guiraud, M., 2003. The LATEA metacraton (Central Hoggar, Tuareg shield, Algeria): behaviour of an old passive margin during the Pan-African orogeny. Journal of African Earth Sciences, 37(3-4), pp.161-190.

4. Augé, T., Joubert, M., & Bailly, L., 2012, Typology of mafic–ultramafic complexes in Hoggar, Algeria: Implications for PGE, chromite and base-metal sulphide mineralisation. Journal of African Earth Sciences, 63, 32-47.

5. Berger, J., Ouzegane, K., Bendaoud, A., Liégeois, J. P., Kiénast, J. R., Bruguier, O., & Caby, R., 2014. Continental subduction recorded by Neoproterozoic eclogite and garnet amphibolites from Western Hoggar (Tassendjanet terrane, Tuareg Shield, Algeria). Precambrian Research, 247, 139-158.

6. Caby R., 2014, Nature and evolution of Neoproterozoic ocean-continent transition: Evidence from the passive margin of the West African craton in NE Mali. Journal of African Earth Sciences, 91, 1-11.

7. Marignac, C., Aïssa, D. E., Bouabsa, L., Kesraoui, M., & Nedjari, S., 2016, The Hoggar Gold and Rare Metals Metallogenic Province of the Pan-African Tuareg Shield (Central Sahara, South Algeria): An Early Cambrian Echo of the Late Ediacaran Murzukian Event?. In Mineral Deposits of North Africa (pp. 371-404). Springer, Cham.

8. Aissa, D. E., & Marignac, C., 2017, Controls on gold deposits in Hoggar, Tuareg shield (southern Algeria). Journal of African Earth Sciences, 127, 136-145.

9. Saad, W., Aissa, D. E., Watanabe, K., & Taguchi, S., 2018, Gold deposits associated with the gabbroic rocks at Tirek area, western Hoggar, Algeria: fluid inclusion study. Arabian Journal of Geosciences, 11(2), 26.

10. Liégeois, J.-P., 2019, A new synthetic map of the Tuareg Shield: an overview of its global structure and geological evolution: in Bendaoud, A., Hamimi, Z., Hamoudi, M., Djemai, S. and Zoheir, B., editors, *The Geology of the Arab World—An Overview:* Springer Geology, Springer, Cham, pp. 83-107.

11. Conoco (1987) Geologic Map of Egypt. Egyptian General Authority for Petroleum (UNESCO Joint Map Project), 20 Sheets, Scale 1:500 000.

12. Azer, M. K. and Stern, R. J., 2007, Neoproterozoic (835-720 Ma) serpentinites in the eastern Desert, Egypt: Fragments of forearc mantle, Journal of Geology, v. 155, p. 457-472

13. Azer, M.K., 2014, Petrological studies of Neoproterozoic serpentinized ultramafics of the Nubian Shield: spinel compositions as evidence of the tectonic evolution of Egyptian ophiolites. Acta Geologica Polonica, 64(1), pp.113-127.

14. Sedki, T., Ali, S., Mohamed, H.A. and Zaki, R., 2019, Sol Hamed Ophiolitic Complex, Southern Eastern Desert, Egypt: Petrological, Economic Potentiality and Structural Implications.

15. Abdallah, S.E., Ali, S. and Obeid, M.A., 2019, Geochemistry of an Alaskan-type mafic-ultramafic complex in Eastern Desert, Egypt: New insights and constraints on the Neoproterozoic island arc magmatism. Geoscience Frontiers, 10(3), pp.941-955.

16. El Kalioubi, B., Fowler, A.R. and Abdelmalik, K., 2020, The Metamorphism and Deformation of the Basement Complex in Egypt. In The Geology of Egypt (pp. 191-251). Springer, Cham.

17. Johnson, P.R., 2006, Explanatory notes to the map of Proterozoic geology of Western Saudi Arabia: Saudi Geological Survey Technical Report SGS-TR-2006-4, 62 p., 22 figs., 2 plates

18. Windley, B. F., Whitehouse M. J. and Mahfood, A. I. B-B., 1996, Early Precambrian gneiss terranes and Pan-African island arcs in Yemen: Crustal accretion of the eastern Arabian Shield, Geology, v. 24(2), p. 131-134.

19. Geological and Mineral Resources Department (G.M.R.D – Sudan), Saudi-Sudanese Red Sea Joint Commission (R.S.C. – Kingdom of Saudi Arabia), and Bureau de Recherches Géologiques et Miniéres (B.R.G.M. – France), 1981. Geological Map of the Sudan scale 1:20000000, drawn by the Départment Arts Graphiques, B. R. G. M. Orléans, France and printed by Impact Graphic, Paris, 1 sheet.

20. GSE, 1973, The Geological Map of Ethiopia (1st edition) Scale 1:2000000, compiled by V. Kazmin in 1972, Geological Survey of Ethiopia, Ministry of Mines, Addis Ababa, Ethiopia

21. El Makkrouf, A. A., 1988. Tectonic interpretation of Jabal Eghei area and its regional application to Tibesti orogenic belt, south central Libya (SPLAJ). Journal of African Earth Sciences (and the Middle East), 7(7-8), 945-967.

22. CGMW and UNESCO,1990, International Geological Map of Africa Scale 1:50000000, Third edition, 6 map sheets.

23. Avigad, D., Gerdes, A., Morag, N. & Bechstädt, T., 2012. Coupled U–Pb–Hf of detrital zircons of Cambrian sandstones from Morocco and Sardinia: implications for provenance and Precambrian crustal evolution of North Africa. Gondwana Research 21, 690–703.

24. Brahimi, S., Liégeois, J. P., Ghienne, J. F., Munschy, M., & Bourmatte, A., 2018, The Tuareg shield terranes revisited and extended towards the northern Gondwana margin: Magnetic and gravimetric constraints. Earth-Science Reviews, 185, 572-599.

25. Blades, M. L., Foden, J., Collins, A. S., Alemu, T. and Woldetinsae, G., 2019, The origin of the ultramafic rocks of the Tulu Dimtu Belt, western Ethiopia – do they represent remnants of the Mozambique Ocean?, Geological Magazine, v. 156(1), pp. 62-82.

26. Boyden, J.R., Müller, R.D., Gurnis, M., Torsvik, T.H., Clark, J., Turner, M., Ivey-Law, H., Watson, R., and Cannon, J., 2011, Next-generation plate-tectonic reconstructions using GPlates, in Keller, R., and Baru, C., editors, *Geoinformatics*: Cambridge, UK, Cambridge University Press, pp. 95–114.

27. Torsvik, T.H. and Cocks, L.R.M., 2017, *Earth History and Palaeogeography*: Cambridge University Press, 317 pp.

28. Black, R., Liegeois, J.P., 1991. Pan-African plutonism of the Damagaram inlier, Niger Republic. Journal African Earth Sciences 13, 471–482.

29. Dixon, T.H., 1981. Age and chemical characteristics of some pre-Pan- African rocks in the Egyptian Shield. Precambrian Research 14, 119–133.

30. Stern, R.J., 1979. Late Precambrian Ensimatic Volcanism in the Central Eastern Desert, Egypt. Ph.D. thesis, Univ. California, San Diego.

31. Harms, U., Schandelmeier, H., Darbyshire, D.P.F., 1990. Pan-African reworked early/middle Proterozoic crust in NE Africa W of the Nile: Sr and Nd isotope evidence. Journal Geological Society, London 147, 859–872.

32. Harms, U., Darbyshire, D.P.F., Denkler, T., Hengst, M., Schandelmeier, H., 1994. Evolution of the Neoproterozoic Delgo suture zone andcrustal growth in northern Sudan: Geochemical and radiogenic isotope constraints. Geol Rundsch 83: 591-603.

33. Abdel Rahman, E., Harms, U., Schandelmeier, H., Franz, G., Darbyshire, D. P. F., Horn, P., & Müller-Sohnius, D., 1990. A new ophiolite occurrence in NW Sudan–constraints on Late Proterozoic tectonism. Terra nova, 2(4), 363-376.

34. Blasband, B. B., 2006. Neoproterozoic Tectonics of the Arabian-Nubian Shield. Ph.D. Thesis, Mededelingen van die Faculteit Geowetenschappen, Universiteit Utrecht, Utrecht, The Netherlands.

35. Fleck, R. J., Greenwood, W. R., Hadley, D. G., Anderson, R. E., & Schmidt, D. L., 1980. Rubidium-strontium geochronology and plate-tectonic evolution of the southern part of the Arabian Shield (No. 1131). US Geological Survey; for sale by the Supt. of Docs., GPO.

36. Hadley, D.G., 1976, Geology of the Bi'r Juqjuq quadrangle, Sheet 21/43D, Kingdom of Saudi Arabia: Saudi Arabian Directorate General Mineral Resources Geologic Map GM-26, scale 1:100,000, with text.

37. Coleman, R. G., 1973, Reconnaissance geology of the Khamis Mushayt quadrangle, Kingdom of Saudi Arabia: Saudi Arabian Directorate General Mineral Resources Geologic Map GM-5, scale 1:100,000.

38. Johnson, P.R., Kattan, F.H. and Wooden, J.L., 2001. Implications of SHRIMP and microstructural data on the age and kinematics of shearing in the Asir Terrane, southern Arabian Shield, Saudi Arabia. Gondwana Research, 4(2), pp.172-173.

39. Genna, A., Guerrot, C., Deschamps, Y., Nehlig, P., & Shanti, M., 1999. Les formations Ablah d'Arabie Saoudite (datation et implication géologique). Comptes Rendus de l'Académie des Sciences-Series IIA-Earth and Planetary Science, 329(9), 661-667.

40. Küster, D., Liegeois, J.-P., 2001. Sr, Nd isotopes and geochemistry of the Bayuda Desert high-grade metamorphic basement (Sudan): an early Pan-African oceanic convergent margin, not the edge of the East Saharan ghost craton. Precambrian Research 109, 1–23.

41. Liégeois, J.P., Black, R., Navez, J. and Latouche, L., 1994. Early and late Pan-African orogenies in the Air assembly of terranes (Tuareg Shield, Niger). Precambrian research, 67(1-2), pp.59-88.

42. Black, R., Liegeois, J.P., Navez, J. and Vialette, Y., 1991. Terrains exotiques dans les zones internes de la chaîne panafricaine trans-saharienne: les clefs fournies par l'Aïr sudoriental (République du Niger). C. R. Acad. Sci. Paris, 312: 889-895.

43. Pegram, W.J., Register, J.K., Fullagar, P.D., Ghuma, M.A., Rogers, J.J.W., 1976. Pan-African ages from a Tibesti massif batholith, southern Libya. Earth and Planetary Scientific Letters 30, 123– 128.

44. Pin, C., Poidevin, J.L., 1987. U–Pb zircon evidence for a Pan- African granulite facies metamorphism in the Central African Republic. A new interpretation of the high-grade series of the northern border of the Congo Craton. Precambrian Research 36, 303–312.

45. Duyverman, H. J., Harris, N. B., & Hawkesworth, C. J., 1982. Crustal accretion in the Pan African: Nd and Sr isotope evidence from the Arabian Shield. Earth and Planetary Science Letters, 59(2), 315-326.

46. Pallister, J.S., Stacey, J.S., Fischer, L.B. and Premo, W.R., 1988. Precambrian ophiolites of Arabia: Geologic settings, U- Pb geochronology, Pb-isotope characteristics, and implications for continental accretion. Precambrian Research, 38(1), pp.1-54.

47. Claesson, S., Pallister, J. S., & Tatsumoto, M., 1984. Samarium-neodymium data on two late Proterozoic ophiolites of Saudi Arabia and implications for crustal and mantle evolution. Contributions to Mineralogy and Petrology, 85(3), 244-252.

48. Ledru, P., and Augé, T., 1984. The Al ‘Ays ophiolitic complex petrology and structural evolution: Saudi Arabian Deputy Ministry for Mineral Resources Open-File Report BRGM-OF- 04-15, 57 p.

49. Kröner, A., Halpern, M., and Basahel, A., 1984, Age and significance of metavolcanic sequences and granitoid gneisses from the Al-Lith area, Southwestern Arabian shield: Bulletin of the Faculty of Earth Sciences, King Abdulaziz University, v. 6, p. 380-388.

50. Stacey, J.S., Stoeser, D.B., Greenwood, W.R. and Fischer, L.B., 1984. U-Pb zircon geochronology and geological evolution of the Halaban-Al Amar region of the Eastern Arabian Shield, Kingdom of Saudi Arabia. Journal of the Geological Society, 141(6), pp.1043-1055.

51. Stacey, J.S. and Agar, R.A., 1985. U-Pb Isotopic evidence for the accretion of a continental microplate in the Zalm region of the Saudi Arabian Shield. Journal of the Geological Society, 142(6), pp.1189-1203.

52. Sultan, M., Tucker, R.D., El Alfy, Z., Attia, R., Ragab, A.G., 1994. U–Pb (zircon) ages for the gneissic terrane west of the Nile, southern Egypt. Geologische Rundschau 83, 514–522.

53. Abdel-Rahman, A. F. M., & Doig, R.,1987. The Rb-Sr geochronological evolution of the Ras Gharib segment of the northern Nubian Shield. Journal of the Geological Society, 144(4), 577-586.

54. Aït Malek, H., Gasquet, D., Bertrand, J.M., Leterrier, J., 1998. Eburnian and Panafrican granitoids from the Igherm, Kerdous and Bas-Draa Proterozoic inliers (western Anti-Atlas, Morocco): U–Pb geochronology on zircon Comptes Rendus de l'Academie des Sciences Series IIA Earth and Planetary Science, 327, pp. 819-826

55. Pons, J., Barbey, P., Nachit, H. and Burg, J.P., 2006. Development of igneous layering during growth of pluton: The Tarcouate Laccolith (Morocco). Tectonophysics, 413(3-4), pp.271-286.

56. Charlot, R., 1982. Caractérisation des événements éburnéens et panafricains dans l'Anti-Atlas marocain. Apport de la méthode géochronologique Rb/Sr. N.M.Serv.Géol.Maroc 313.

57. Darbyshire, D. P. F., Jackson, N. J., Ramsay, C. R., & Roobol, M. J., 1983. Rb-Sr isotope study of latest Proterozoic volcano-sedimentary belts in the Central Arabian Shield. Journal of the Geological Society, 140(2), 203-213.

58. D'Lemos, R. S., Inglis, J. D., & Samson, S. D., 2006. A newly discovered orogenic event in Morocco: Neoproterozic ages for supposed Eburnean basement of the Bou Azzer inlier, Anti-Atlas Mountains. Precambrian Research, 147(1-2), 65-78.

59. Inglis, J.D., D'Lemos, R.S., Samson, S.D. and Admou, H., 2005. Geochronological constraints on Late Precambrian intrusion, metamorphism, and tectonism in the Anti-Atlas Mountains. The Journal of geology, 113(4), pp.439-450.

60. El Hadi, H., Simancas, J. F., Martínez-Poyatos, D., Azor, A., Tahiri, A., Montero, P., Fanning, C.M., Bea, F. & González-Lodeiro, F., 2010. Structural and geochronological constraints on the evolution of the Bou Azzer Neoproterozoic ophiolite (Anti-Atlas, Morocco). Precambrian Research, 182(1-2), 1-14.

61. Eyal, M., Litvinovsky, B. A., Katzir, Y., & Zanvilevich, A. N., 2004. The Pan-African high-K calc-alkaline peraluminous Elat granite from southern Israel: geology, geochemistry and petrogenesis. Journal of African Earth Sciences, 40(3-4), 115-136.

62. Gasquet, D., Chevremont, P., Baudin, T., Chalot-Prat, F., Guerrot, C., Cocherie, A., Roger, J., Hassenforder, B. & Cheilletz, A., 2004. Polycyclic magmatism in the Tagragra d'Akka and Kerdous–Tafeltast inliers (Western Anti-Atlas, Morocco). Journal of African Earth Sciences, 39(3-5), 267-275.

63. Inglis, J.D., MacLean, J.S., Samson, S.D., D'Lemos, R.S., Admou, H. and Hefferan, K., 2004. A precise U–Pb zircon age for the Bleida granodiorite, Anti-Atlas, Morocco: implications for the timing of deformation and terrane assembly in the eastern Anti-Atlas. Journal of African Earth Sciences, 39(3-5), pp.277-283.

64. Liégeois, J.P., Bertrand, J.M. and Black, R., 1987. The subduction-and collision-related Pan-African composite batholith of the Adrar des Iforas (Mali): A review. Geological Journal, 22(S2), pp.185-211.

65. Nouar, O., Henry, B., Liégeois, J.P., Derder, M.E.M., Bayou, B., Bruguier, O., Ouabadi, A., Amenna, M., Hemmi, A. and Ayache, M., 2011. Eburnean and Pan-African granitoids and the Raghane mega-shear zone evolution: Image analysis, U–Pb zircon age and AMS study in the Arokam Ténéré (Tuareg shield, Algeria). Journal of African Earth Sciences, 60(3), pp.133-152.

66. Henry, B., Liégeois, J.P., Nouar, O., Derder, M.E.M., Bayou, B., Bruguier, O., Ouabadi, A., Belhai, D., Amenna, M., Hemmi, A. and Ayache, M., 2009. Repeated granitoid intrusions during the Neoproterozoic along the western boundary of the Saharan metacraton, Eastern Hoggar,

Tuareg shield, Algeria: an AMS and U–Pb zircon age study. Tectonophysics, 474(3-4), pp.417-434.

67. Bertrand, J. M. L., Caby, R., Ducrot, J., Lancelot, J., Moussine-Pouchkine, A., & Saadallah, A., 1978. The late Pan-African intracontinental linear fold belt of the eastern Hoggar (Central Sahara, Algeria): geology, structural development, U/Pb geochronology, tectonic implications for the Hoggar shield. Precambrian Research, 7(4), 349-376.

68. Stern, R. J., 1981. Petrogenesis and tectonic setting of Late Precambrian ensimatic volcanic rocks, Central Eastern Desert of Egypt. Precambrian Research, 16(3), 195-230.

69. Fullagar, P. D., PD, F., & Greenberg, J.K, 1978. Egyptian Younger Granites: A Single Period of Plutonism. Precambrian Res., 6 (1978), p. A22

70. Wahed, A.A.A., Ali, K.G. A., Khalil, M.M.A. & Gawad, A.E.A, 2010. Dokhan volcanics of Gabal Monqul area, North Eastern Desert, Egypt: geochemistry and petrogenesis. Arabian Journal of Geosciences. 5. 10.1007/s12517-010-0136-z.

71. Breitkreuz, C., Eliwa, H., Khalaf, I., El Gameel, K., Sergeev, S., Larionov, A., 2010 Neoproterozoic SHRIMP U–Pb zircon ages of Dokhan Volcanics in the northern part of the Eastern Desert, Egypt. 33rd International Geological Congress Oslo 2008 August 6–14th. Abstract

72. Segev, A., 1987. The age of the latest Precambrian volcanism in southern Israel, northeastern Sinai and southwestern Jordan-a re-evaluation. Precambrian research, 36(3-4), pp.277-285.

73. Bielski, M., 1982a. Stages in the Evolution of the Arabian- Nubian Massif in Sinai. Ph.D. Thesis, Hebrew Univ. of Jerusalem, 155 pp. (in Hebrew).

74. Bielski, M., 1982b. On the problem of the Lower Cambrian, age in the Arabian-Nubian Massif. In: G.S. Odin (Editor), Numerical Dating in Stratigraphy. Wiley, Chichester, pp. 943-948.

75. Lenz, H., Bender, F., Besang, C., Harre, W., Kreuzer, H., Muller, P. and Wendt, I., 1972. The age of early tectonic events in the zone of the Jordan geosuture, based on radiometric data. 24th Int. Geol. Congr. Montreal, 3: 371-379.

76. Stern, R.J. and Hedge, C.E., 1985. Geochronologic and isotopic constraints on late Precambrian crustal evolution in the Eastern Desert of Egypt. American Journal of Science, 285(2), pp.97-127.

77. Stern, R.J. and Manton, W.I., 1987. Age of Feiran basement rocks, Sinai: implications for late Precambrian crustal evolution in the northern Arabian–Nubian Shield. Journal of the Geological Society, 144(4), pp.569-575.

78. Eyal, Y., Eyal, M., Litvinovsky, B., Jahn, B. M., Calvo, R., & Golan, T., 2019. The evolution of the Neoproterozoic Elat Metamorphic Complex, northernmost Arabian-Nubian Shield: Island arc to syncollisional stage and post-collisional magmatism. Precambrian Research, 320, 137-170.

79. Kröner, A., Krüger, J. and Rashwan, A.E.A.A., 1994. Age and tectonic setting of granitoid gneisses in the Eastern Desert of Egypt and south-west Sinai. Geologische Rundschau, 83(3), pp.502-513.

80. Andresen, A., El-Rus, M. A. A., Myhre, P. I., Boghdady, G. Y., & Corfu, F., 2009. U–Pb TIMS age constraints on the evolution of the Neoproterozoic Meatiq Gneiss dome, Eastern Desert, Egypt. International Journal of Earth Sciences, 98(3), 481-497.

81. Fritz, H., Dallmeyer, D.R., Wallbrecher, E., Loizenbauer, J., Hoinkes, G., Neumayr, P. and Khudeir, A.A., 2002. Neoproterozoic tectonothermal evolution of the Central Eastern Desert, Egypt: a slow velocity tectonic process of core complex exhumation. Journal of African Earth Sciences, 34(3-4), pp.137-155.

82. Fritz, H., Wallbrecher, E., Khudeir, A.A., Abu El Ela, F., Dallmeyer, D.R., 1996. Formation of Neoproterozoic metamorphic core complexes during oblique convergence (Eastern Desert, Egypt). Journal of African Earth Sciences 23, 311–323.

83. Hassan, M.A., and Hashad, A.H., 1990. Precambrian of Egypt, in Said, R., ed, The Geology of Egypt, Netherlands, Balkema- Rotterdam, p. 201–245.

84. Stern, R.J., Ali, K.A., Liégeois, J.P., Johnson, P.R., Kozdroj, W. and Kattan, F.H., 2010. Distribution and significance of pre-Neoproterozoic zircons in juvenile Neoproterozoic igneous rocks of the Arabian-Nubian Shield. American Journal of Science, 310(9), pp.791-811.

85. Kröner, A., Todt, W., Hussein, I.M., Mansour, M. and Rashwan, A., 1992. Dating of late Proterozoic ophiolites in Egypt and the Sudan using the single grain zircon evaporation technique. Precambrian Research, 59(1-2), pp.15-32.

86. Loizenbauer, J., Wallbrecher, E., Fritz, H., Neumayr, P., Khudeir, A.A. and Kloetzli, U., 2001. Structural geology, single zircon ages and fluid inclusion studies of the Meatiq metamorphic core complex: implications for Neoproterozoic tectonics in the Eastern Desert of Egypt. Precambrian Research, 110(1-4), pp.357-383.

87. Sami, M., Ntaflos, T., Farahat, E.S., Mohamed, H.A., Hauzenberger, C. and Ahmed, A.F., 2018. Petrogenesis and geodynamic implications of Ediacaran highly fractionated A-type granitoids in the north Arabian-Nubian Shield (Egypt): constraints from whole-rock geochemistry and Sr-Nd isotopes. Lithos, 304, pp.329-346.

88. Abd El-Naby, H., Frisch, W. and Siebel, W., 2008. Tectono-metamorphic evolution of the Wadi Hafafit Culmination (central Eastern Desert, Egypt). Implication for Neoproterozoic core complex exhumation in NE Africa. Geologica Acta: an international earth science journal, 6(4), pp.293-312.

89. Ali, K. A., Stern, R. J., Manton, W. I., Kimura, J. I., & Khamees, H. A., 2009a. Geochemistry, Nd isotopes and U–Pb SHRIMP zircon dating of Neoproterozoic volcanic rocks from the Central Eastern Desert of Egypt: New insights into the∼ 750 Ma crust-forming event. Precambrian Research, 171(1-4), 1-22.

90. Ali, K. A., Azer, M. K., Gahlan, H. A., Wilde, S. A., Samuel, M. D., & Stern, R. J., 2010. Age constraints on the formation and emplacement of Neoproterozoic ophiolites along the Allaqi–Heiani Suture, South Eastern Desert of Egypt. Gondwana Research, 18(4), 583-595.

91. Ali, K., Andresen, A., Manton, W. I., Stern, R. J., Omar, S. A., & Maurice, A. E., 2012. U–Pb zircon dating and Sr–Nd–Hf isotopic evidence to support a juvenile origin of the~ 634 Ma El Shalul granitic gneiss dome, Arabian–Nubian Shield. Geological Magazine, 149(5), 783-797.

92. Ali, K. A., Kröner, A., Hegner, E., Wong, J., Li, S. Q., Gahlan, H. A., & El Ela, F. F. A., 2015. U–Pb zircon geochronology and Hf–Nd isotopic systematics of Wadi Beitan granitoid gneisses, south Eastern Desert, Egypt. Gondwana Research, 27(2), 811-824.

93. Ali, B. H., Wilde, S. A., & Gabr, M. M. A., 2009b. Granitoid evolution in Sinai, Egypt, based on precise SHRIMP U–Pb zircon geochronology. Gondwana Research, 15(1), 38-48.

94. Augland, L. E., Andresen, A., & Boghdady, G. Y., 2012. U–Pb ID-TIMS dating of igneous and metaigneous rocks from the El-Sibai area: time constraints on the tectonic evolution of the Central Eastern Desert, Egypt. International Journal of Earth Sciences, 101(1), 25-37.

95. Bregar, M., Bauernhofer, A., Pelz, K., Kloetzli, U., Fritz, H., & Neumayr, P., 2002. A late Neoproterozoic magmatic core complex in the Eastern Desert of Egypt: emplacement of granitoids in a wrench-tectonic setting. Precambrian Research, 118(1-2), 59-82

96. Lundmark, A.M., Andresen, A., Hassan, M.A., Augland, L.E. and Boghdady, G.Y., 2012. Repeated magmatic pulses in the East African Orogen in the Eastern Desert, Egypt: an old idea supported by new evidence. Gondwana Research, 22(1), pp.227-237.

97. Thomas, R.J., Chevallier, L.P., Gresse, P.G., Harmer, R.E., Eglington, B.M., Armstrong, R.A., De Beer, C.H., Martini, J.E.J., De Kock, G.S., Macey, P.H. and Ingram, B.A., 2002. Precambrian evolution of the Sirwa window, Anti-Atlas orogen, Morocco. Precambrian Research, 118(1-2), pp.1-57.

98. Tubosun, I.A., Lancelot, J.R., Rahaman, M.A. and Ocan, O., 1984. U-Pb Pan-African ages of two charnockite-granite associations from southwestern Nigeria. Contributions to Mineralogy and Petrology, 88(1-2), pp.188-195.

99. Shellnutt, J.G., Pham, N.H.T., Denyszyn, S.W., Yeh, M.W. and Lee, T.Y., 2017. Timing of collisional and post-collisional Pan-African Orogeny silicic magmatism in south-central Chad. Precambrian Research, 301, pp.113-123.

100. Kröner, A., Stern, R.J., Dawoud, A.S., Compston, W., Reischmann, T., 1987. The Pan-African continental margin in NE Africa: evidence from a geochronological study of granulites at Sabaloka, Sudan. Earth Planetary Science Letters 85, 91–104.

101. Bertrand, J. M., Michard, A., Boullier, A. M., & Dautel, D., 1986. Structure and U/Pb geochronology of Central Hoggar (Algeria): A reappraisal of its Pan-African evolution. Tectonics, 5(7), 955-972.

102. Liégeois, J.P. and Stern, R.J., 2010. Sr–Nd isotopes and geochemistry of granite-gneiss complexes from the Meatiq and Hafafit domes, Eastern Desert, Egypt: no evidence for pre-Neoproterozoic crust. Journal of African Earth Sciences, 57(1-2), pp.31-40.

103. Inglis, J.D., Hefferan, K., Samson, S.D., Admou, H. and Saquaque, A., 2017. Determining age of Pan African metamorphism using Sm-Nd garnet-whole rock geochronology and phase equilibria modeling in the Tasriwine ophiolite, Sirwa, Anti-Atlas Morocco. Journal of African Earth Sciences, 127, pp.88-98.

104. Gasquet, D., Levresse, G., Cheilletz, A., Azizi-Samir, M. R., & Mouttaqi, A., 2005. Contribution to a geodynamic reconstruction of the Anti-Atlas (Morocco) during Pan-African times with the emphasis on inversion tectonics and metallogenic activity at the Precambrian–Cambrian transition. Precambrian Research, 140(3-4), 157-182.

105. Ducrot, J., & Lancelot, J. R., 1977. Problème de la limite Précambrien–Cambrien: étude radiochronologique par la méthode U–Pb sur zircons du volcan du Jbel Boho (Anti-Atlas marocain). Canadian Journal of Earth sciences, 14(12), 2771-2777.

106. Landing, E., Bowring, S.A., Davidek, K.L., Westrop, S.R., Geyer, G. and Heldmaier, W., 1998. Duration of the Early Cambrian: U-Pb ages of volcanic ashes from Avalon and Gondwana. Canadian Journal of Earth Sciences, 35(4), pp.329-338.

107. Walsh, G.J., Aleinikoff, J.N., Benziane, F., Yazidi, A. and Armstrong, T.R., 2002. U–Pb zircon geochronology of the Paleoproterozoic Tagragra de Tata inlier and its Neoproterozoic cover, western Anti-Atlas, Morocco. Precambrian Research, 117(1-2), pp.1-20.

108. Samson, S.D., Inglis, J.D., D'lemos, R.S., Admou, H., Blichert-Toft, J. and Hefferan, K., 2004. Geochronological, geochemical, and Nd–Hf isotopic constraints on the origin of Neoproterozoic plagiogranites in the Tasriwine ophiolite, Anti-Atlas orogen, Morocco. Precambrian Research, 135(1-2), pp.133-147.

109. Mifdal, A. and Peucat, J.J., 1985. Datations U-Pb et Rb-Sr du volcanisme acide de l'Anti-Atlas marocain et du socle sous-jacent dans la région de Ouarzazate. Apport au problème de la limite Précambrien-Cambrien. U-Pb and Rb-Sr dating of acidic volcanic rocks and Precambrian basement in Anti-Atlas of Morocco (Ouarzazate). Contribution for numerical dating of Precambrian-Cambrian boundary. Sciences Géologiques, bulletins et mémoires, 38(2), pp.185-200.

110. Walsh, G.J., Aleinikoff, J.N., Benziane, F., Yazidi, A. and Armstrong, T.R., 2002. U–Pb zircon geochronology of the Paleoproterozoic Tagragra de Tata inlier and its Neoproterozoic cover, western Anti-Atlas, Morocco. Precambrian Research, 117(1-2), pp.1-20.

111. Beyth, M., & Heimann, A. (1999). The youngest igneous event in the crystalline basement of the Arabian-Nubian Shield, Timna Igneous Complex. Isr. J. Earth Sci, 48(2), 113-120.

112. Be'eri-Shlevin, Y., Katzir, Y., & Valley, J. W., 2009b. Crustal evolution and recycling in a juvenile continent: oxygen isotope ratio of zircon in the northern Arabian Nubian Shield. Lithos, 107(3-4), 169-184.

113. Be'eri-Shlevin, Y., 2008. The origin and evolution of Neoproterozoic magmatism in the northern Arabian-Nubian Shield (Sinai Peninsula, Egypt and southern Israel): evidence from stable and radiogenic isotope record. Unpublished Ph.D. thesis, Ben-Gurion University, Israel. 134 pp.

114. Beyth, M., & Reischmann, T. (1996). The age of the quartz monzodiorite, the youngest plutonic intrusion in the Timna Igneous Complex. Israel Journal of Earth Sciences, 45, 223-226.

115. Be'eri-Shlevin, Y., Katzir, Y., & Whitehouse, M., 2009a. Post-collisional tectonomagmatic evolution in the northern Arabian–Nubian Shield: time constraints from ion-probe U–Pb dating of zircon. Journal of the Geological Society, 166(1), 71-85.

116. Beyth, M., Stern, R. J., Altherr, R., & Kröner, A. (1994). The late Precambrian Timna igneous complex, southern Israel: evidence for comagmatic-type sanukitoid monzodiorite and alkali granite magma. Lithos, 31(3-4), 103-124.

117. Morag, N., Avigad, D., Gerdes, A., Belousova, E. and Harlavan, Y., 2011. Crustal evolution and recycling in the northern Arabian-Nubian Shield: New perspectives from zircon Lu–Hf and U–Pb systematics. Precambrian Research, 186(1-4), pp.101-116.

118. Katz, O., Avigad, D., Matthews, A. and Heimann, A., 1998. Precambrian metamorphic evolution of the Arabian-Nubian Shield in the Roded area. Israel Journal of Earth Sciences, 47, pp.93-110.

119. Kröner, A., Eyal, M. and Eyal, Y., 1990. Early Pan-African evolution of the basement around Elat, Israel, and the Sinai Peninsula revealed by single-zircon evaporation dating, and implications for crustal accretion rates. Geology, 18(6), pp.545-548.

120. Kröner, A., Linnebacher, P., Stern, R.J., Reischmann, T., Manton, W. and Hussein, I.M., 1991. Evolution of Pan-African island arc assemblages in the southern Red Sea Hills, Sudan, and in southwestern Arabia as exemplified by geochemistry and geochronology. Precambrian Research, 53(1-2), pp.99-118.

121. Reischmann, T., Bachtadse, V., Kröner, A. and Layer, P., 1992. Geochronology and palaeomagnetism of a late Proterozoic island arc terrane from the Red Sea Hills, northeast Sudan. Earth and Planetary Science Letters, 114(1), pp.1-15.

122. Küster, D., Liégeois, J.P., Matukov, D., Sergeev, S. and Lucassen, F., 2008. Zircon geochronology and Sr, Nd, Pb isotope geochemistry of granitoids from Bayuda Desert and Sabaloka (Sudan): evidence for a Bayudian event (920–900 Ma) preceding the Pan-African orogenic cycle (860–590 Ma) at the eastern boundary of the Saharan Metacraton. Precambrian Research, 164(1-2), pp.16-39.

123. Moussa, E.M., Stern, R.J., Manton, W.I. and Ali, K.A., 2008. SHRIMP zircon dating and Sm/Nd isotopic investigations of Neoproterozoic granitoids, Eastern Desert, Egypt. Precambrian Research, 160(3-4), pp.341-356.

124. Geisler, T., Rashwan, A. A., Rahn, M. K. W., Poller, U., Zwingmann, H., Pidgeon, R. T., Schleicher, H. & Tomaschek, F., 2003. Low-temperature hydrothermal alteration of natural metamict zircons from the Eastern Desert, Egypt. Mineralogical Magazine, 67(3), 485-508.

125. Wilde, S.A. and Youssef, K., 2000. Significance of SHRIMP U-Pb dating of the imperial porphyry and associated Dokhan volcanics, Gebel Dokhan, north Eastern Desert, Egypt. Journal of African Earth Sciences, 31(2), pp.403-413.

126. Hargrove, U.S., 2006, Crustal evolution of the Neoproterozoic Bi'r Umq suture zone, Kingdom of Saudi Arabia: Geochronological, isotopic, and geochemical constraints: Ph.D. Thesis, University of Texas at Dallas, 343 p.

127. Kennedy, A., Johnson, P.R., and Kattan, F.H., 2004. SHRIMP geochronology in the northern Arabian Shield, Part I: Data acquisition: Saudi Geological Survey Open-file Report SGS- OF-2004-11, 28 pp.

128. Kennedy, A., Johnson, P.R., and Kattan, F.H., 2005. SHRIMP geochronology in the northern Arabian Shield: Part II: Data acquisition 2004: Saudi Geological Survey Open-File Report SGS-OF-2005-10, 44 pp.

129. Doebrich, J. L., Al-Jehani, A. M., Siddiqui, A. A., Hayes, T. S., Wooden, J. L., & Johnson, P. R., 2007. Geology and metallogeny of the Ar Rayn terrane, eastern Arabian shield: evolution of a Neoproterozoic continental-margin arc during assembly of Gondwana within the East African Orogen. Precambrian Research, 158(1-2), 17-50.

130. Whitehouse, M.J., Windley, B.F., Ba-Bttat, M.A., Fanning, C.M. and Rex, D.C., 1998. Crustal evolution and terrane correlation in the eastern Arabian Shield, Yemen: geochronological constraints. Journal of the Geological Society, 155(2), pp.281-295.

131. Finger, F., Dörr, W., Gerdes, A., Gharib, M., & Dawoud, M., 2008. U-Pb zircon ages and geochemical data for the Monumental Granite and other granitoid rocks from Aswan, Egypt: implications for the geological evolution of the western margin of the Arabian Nubian Shield. Mineralogy and Petrology, 93(3-4), 153.

132. Azer, M. K., Stern, R. J., & Kimura, J. I., 2010. Origin of a Late Neoproterozoic (605±13 Ma) intrusive carbonate–albitite complex in Southern Sinai, Egypt. International Journal of Earth Sciences, 99(2), 245-267.

133. Bea, F., Abu-Anbar, M., Montero, P., Peres, P., & Talavera, C., 2009. The ~844 Ma Moneiga quartz-diorites of the Sinai, Egypt: Evidence for Andean-type arc or rift-related magmatism in the Arabian-Nubian Shield?. Precambrian Research, 175(1-4), 161-168.

134. Kröner, A. and Sassi, F.P., 1996. Evolution of the northern Somali basement: new constraints from zircon ages. Journal of African Earth Sciences, 22(1), pp.1-15.

135. Schandelmeier, H., Rahman, E.A., Wipfler, E., Küster, D., Utke, A. and Matheis, G., 1994. Late Proterozoic magmatism in the Nakasib suture, Red Sea Hills, Sudan. Journal of the Geological Society, 151(3), pp.485-497.

136. Stern, R.J. and Kröner, A., 1993. Late Precambrian crustal evolution in NE Sudan: isotopic and geochronologic constraints. The Journal of Geology, 101(5), pp.555-574.

137. Stern, R.J., Kröner, A.; Manton, W. I.; Reischmann, T.; Mansour, M.; and Hussein, I. M., 1989, Geochronology of the late Precambrian Hamisana shear zone, Red Sea Hills, Sudan and Egypt: Jour. Geol. Soc. London, v. 146, p. 1017-1029.

138. Teklay, M., 1997. Petrology, Geochemistry and Geochronology of Neoproterozoic Magmatic Arc Rocks from Eritrea: Implications for Crustal Evolution in the Southern Nubian Shield, vol. 1. Department of Mines, Eritrea, p. 125 (Memoir).

139. Teklay, M., Kröner, A., Mezger, K. and Oberhänsli, R., 1998. Geochemistry, Pb-Pb single zircon ages and Nd-Sr isotope composition of Precambrian rocks from southern and eastern Ethiopia: implications for crustal evolution in East Africa. Journal of African Earth Sciences, 26(2), pp.207-227.

140. Blein, O., Baudin, T., Chevremont, P., Soulaimani, A., Admou, H., Gasquet, P., Cocherie, A., Egal, E., Youbi, N., Razin, P., Bouabdelli, M., Gombert, P., 2014a. Geochronological constraints on the polycyclic magmatism in the Bou Azzer-El Graara inlier (central Anti-Atlas Morocco). Journal of African Earth Sciences, 99, 287-306.

141. Blein, O., Baudin, T., Soulaimani, A., Cocherie, A., Chevremont, P., Admou, H., Ouanaimi, H., Razin, P., Bouabdelli, M., & Roger, J., 2014b. New geochemical, geochronological and structural constraints on the Ediacaran evolution of the south Sirwa, Agadir-Melloul and Iguerda inliers, Anti-Atlas, Morocco. Journal of African Earth Sciences, 98, 47-71.

142. Suayah, I.B., Miller, J.S., Miller, B.V., Bayer, T.M. and Rogers, J.J., 2006. Tectonic significance of Late Neoproterozoic granites from the Tibesti massif in southern Libya inferred from Sr and Nd isotopes and U–Pb zircon data. Journal of African Earth Sciences, 44(4-5), pp.561-570.

143. Suayah, I.B. and Rogers, J.J., 1986. Geochemistry, chronology and petrogenesis of the Wadi Yebigue pluton, central Tibisti massif, Libya. Journal of African Earth Sciences (1983), 5(4), pp.413-422.

144. Caby, R., Andreopoulos-Renaud, U., & Pin, C., 1989. Late Proterozoic arc–continent and continent–continent collision in the Pan-African Trans-Saharan Belt of Mali. Canadian Journal of Earth Sciences, 26(6), 1136-1146.

145. Ferkous, K., & Monie, P., 2002. Neoproterozoic shearing and auriferous hydrothermalism along the lithospheric N–S East in Ouzzal shear zone (Western Hoggar, Algeria, North Africa). Journal of African Earth Sciences, 35(3), 399-415.

146. Hadj-Kaddour, Z., Liegeois, J.P., Demaiffe, D. and Caby, R., 1998. The alkaline–peralkaline granitic post-collisional Tin Zebane dyke swarm (Pan-African Tuareg shield, Algeria): prevalent mantle signature and late agpaitic differentiation. Lithos, 45(1-4), pp.223-243.

147. Lancelot, J.R., Boullier, A.M., Maluski, H. and Ducrot, J., 1983. Deformation and related radiochronology in a late Pan-African mylonitic shear zone, Adrar des Iforas (Mali). Contributions to Mineralogy and Petrology, 82(4), pp.312-326.

148. Paquette, J.L., Caby, R., Djouadi, M.T. and Bouchez, J.L., 1998. U–Pb dating of the end of the Pan-African orogeny in the Tuareg shield: the post-collisional syn-shear Tioueine pluton (Western Hoggar, Algeria). Lithos, 45(1-4), pp.245-253.

149. Pouclet, A., Ouazzani, H. and Fekkak, A., 2008. The Cambrian volcano-sedimentary formations of the westernmost High Atlas (Morocco): their place in the geodynamic evolution of the West African Palaeo-Gondwana northern margin. Geological Society, London, Special Publications, 297(1), pp.303-327.

150. El Attari, A., Pereira, M. F., Ezzouhairi, H., El Houicha, M., Jouhari, A., Berrada, I., Fekkak, A., Ennih, N., Hoepffner, Ch., Gama, C., & Silva, J. B., 2019. Zircon U-Pb geochronology and geochemistry of Cambrian magmatism in the Coastal Block (Oued Rhebar volcanic complex, Moroccan Meseta): Implications for the geodynamic evolutionary model of North-Gondwana. Journal of African Earth Sciences, 160, 103598.

151. El Houicha, M., Pereira, M. F., Jouhari, A., Gama, C., Ennih, N., Fekkak, A., Ezzouhairi, H., El Attari, A. & Silva, J. B., 2018. Recycling of the Proterozoic crystalline basement in the Coastal Block (Moroccan Meseta): New insights for understanding the geodynamic evolution of the northern peri-Gondwanan realm. Precambrian Research, 306, 129-154.

152. Berrada, I., Fekkak, A., El Houicha, M., Ouanaimi, H., Jouhari, A., Ezzouhairi, H., El Attari, A., Pereira, M.F. and Gasquet, D., 2019, April. First evidence of early Cambrian felsic-intermediate plutonism in the Western High Atlas (Moroccan Atlas-Meseta Domain): SHRIMP U-Pb zircon geochronology study. In Magmatisme, Métamorphisme et Minéralisations Associées 3MA-11ème coll.

153. Bosch, D., Bruguier, O., Caby, R., Buscail, F., & Hammor, D., 2016. Orogenic development of the Adrar des Iforas (Tuareg Shield, NE Mali): New geochemical and geochronological data and geodynamic implications. Journal of Geodynamics, 96, 104-130.

154. Fezaa, N., Liégeois, J. P., Abdallah, N., Cherfouh, E. H., De Waele, B., Bruguier, O., & Ouabadi, A. (2010). Late Ediacaran geological evolution (575–555 Ma) of the Djanet Terrane, Eastern Hoggar, Algeria, evidence for a Murzukian intracontinental episode. Precambrian Research, 180(3-4), 299-327.

155. Ghuma, M. A. (1975). The geology and geochemistry of the Ben Ghnema batholith. Tibisti massif, southern Libya, LAR [Ph. D. thesis]: Houston, Texas, Rice University, 185.

156. Zhang, W., Pease, V., Whitehouse, M.J., El-Sankary, M.M. and Shalaby, M.H., 2019. From the Libyan border to the Nile–Neoproterozoic magmatism and basement evolution of southern Egypt. International Geology Review, 61(16), pp.2057-2079.

157. Shalaby, A., Stüwe, K., Makroum, F., Fritz, H., Kebede, T. and Klötzli, U., 2005. The Wadi Mubarak belt, Eastern Desert of Egypt: a Neoproterozoic conjugate shear system in the Arabian–Nubian Shield. Precambrian Research, 136(1), pp.27-50.

158. Schandelmeier, H., Richter, A. and Harms, U., 1987. Proterozoic deformation of the East Saharan Craton in southeast Libya, south Egypt and north Sudan. Tectonophysics, 140(2-4), pp.233-246.

159. Kozdrój, W., Kennedy, A.K., Johnson, P.R., Ziółkowska-Kozdrój, M. and Kadi, K., 2017. Geochronology in the southern Midyan terrane: a review of constraints on the timing of magmatic pulses and tectonic evolution in a northwestern part of the Arabian Shield. International Geology Review, 60(10), pp.1290-1319.

160. Kennedy, A., Kozdrój, W., Kattan, F.H., Kozdrój, M.Z., and Johnson, P.R., 2010. SHRIMP Geochronology in the Arabian Shield (Midyan Terrane, Afif Terrane, Ad Dawadimi Terrane) and Nubian Shield (Central Eastern Desert), Part IV. Data acquisition 2008. Saudi Geological Survey Open-File Report SGS-OF-2010-10, 101 pp.

161. Kennedy, A., Kozdrój, W., Johnson, P.R., and Kattan, F.H., 2011a. SHRIMP Geochronology in the Northern Arabian Shield. Part III. Data Acquisition 2006. Saudi Geological Survey. Open-File Report SGS-OF-2007-9, 81 pp.

162. Kennedy, A., Kozdrój, W., Kadi, K., Kozdrój, M.Z., and Johnson, P. R., 2011b. SHRIMP geochronology in the Arabian Shield (Midyan Terrane, Afif Terrane) and Nubian Shield (Central Eastern Desert Terrane), Part V: Data acquisition 2009. Saudi Geological Survey. Open-File Report SGS-OF-2010-11, 80 pp.

163. Hassan, M., Stüwe, K., Abu-Alam, T.S., Klötzli, U., and Tiepolo, M., 2016a. Time constraints on deformation of the Ajjaj branch of one of the largest Proterozoic shear zones on Earth: The Najd Fault System: Gondwana Research, no. 34, p. 346–362. 10.1016/j.gr.2015.04.009

164. Vickers-Rich, P., Ivantsov, A., Kattan, F.H., Johnson, P.R., Al-Qubsani, A., Kashghari, W., Leonov, M., Rich, T.H., Linnemann, U., Hofmann, M., Trusler, P., Smith, J., Yazedi, A., Rich, B., Al-Garni Shamari, A., Al-Barakati, A., and Al-Kaff, M.H., 2013, In search of the Kingdom's Ediacarans: The first genuine metazoans (macroscopic body and trace fossils) from the Neoproterozoic Jibalah group (Vendian/Ediacaran) on the Arabian Shield: Saudi Geological Survey Technical Report, SGS-TR-2013-5. 21 p.

165. Vickers-Rich, P., Kozdrój, W., Kattan, F.H., Leonov, M., Ivantsov, A., Johnson, P.R., Linnemann, U., Hofmann, M., Al-Garni, S. M., Al Qubsani, A., Shamari, A., Al-Barakati, A., Al-Kaff, M.H., Ziółkowska-Kozdrój, M., Rich, T.H., Trusler, P., and Rich, B., 2010, Reconnaissance for an Ediacaran Fauna, Kingdom of Saudi Arabia. Saudi Geological Survey, Technical Report, SGS-TR-2010-8, 42 p., 74.

166. Al-Husseini, M., 2015, Spatio-temporal position of the Ediacaran Thalbah Basin in the Najd Fault System, Arabian Shield, GeoArabia, 2015, v. 20, no. 1, p. 17-44.

167. Abdelsalam, M.G., Stern, R.J., Copeland, P., Elfaki, E.M., Elhur, B., Ibrahim, F.M., 1998, The Neoproterozoic Keraf suture in NE Sudan: Sinistral transpression along the eastern margin of West Gondwana. Journal of Geology 106, 133–147.

168. Barth, H.; Besang, C.; Lenz, H.; and Meinhold, K.-D., 1983, Results of Petrological Investigations and Rb/Sr age determinations on the Non-orogenic Ring-com-plexes in the Bayuda Desert, Sudan: Geol. Jb., v. 51, p. 3–34.

169. Aleinikoff, J.N., Stoeser, D.B., 1988. Zircon Morphology and U–Pb Geochronology of Seven Metaluminous and Peralkaline Post-Orogenic Granite Complexes of the Arabian Shield, Kingdom of Saudi Arabia. Saudi Arabian Directorate General of Mineral Resources Open-File Report USGS-OF-06-5, 32 p.

170. Ali, K.A., Stern, R.J., Manton, W.I., Kimura, J.I. and Khamees, H.A., 2009c. Geochemistry, Nd isotopes and U–Pb SHRIMP zircon dating of Neoproterozoic volcanic rocks from the Central Eastern Desert of Egypt: New insights into the~ 750 Ma crust-forming event. Precambrian Research, 171(1-4), pp.1-22.

171. Al-Saleh, A. M. 2012. The Kirsh gneiss dome: An extensional metamorphic core complex from the SE Arabian Shield. Arabian Journal of Geosciences - ARAB J GEOSCI. 5. 10.1007/s12517-010-0179-1.

172. Al-Saleh, A.M., Boyle, A.P., 2001. Structural rejuvenation of the eastern Arabian shield during continental collision: 40Ar/39Ar evidence from the Ar Ridaniyah ophiolite mélange. Journal of African Earth Sciences 33, 135–141.

173. Ali, K.A., Stern, R.J., Manton, W.I., Kimura, J.I., Whitehouse, M.J., Mukherjee, S.K., Johnson, P.R. and Griffin, W.R., 2010b. Geochemical, U–Pb zircon, and Nd isotope investigations of the Neoproterozoic Ghawjah metavolcanic rocks, northwestern Saudi Arabia. Lithos, 120(3-4), pp.379-392.

174. Al-Saleh, A.M., Boyle, A.P., and Mussett, A.E., 1998, Metamorphism and 40Ar/39Ar dating of the Halaban ophiolite and associated units: evidence for two-stage orogenesis in the eastern Arabian shield: Journal of the Geological Society, London, v. 155, p. 165-175.

175. Bokhari, F.Y., and Kramers, J.D., 1981, Island-arc character and late Precambrian age of volcanics at Wadi Shwas, Hijaz, Saudi Arabia: geochemical and Sr and Nd isotopic evidence: Earth and Planetary Science Letters, v. 54, p. 409-422.

176. Cooper, J.A., Stacey, J.S., Stoeser, D.B., and Flack, R.J., 1979. An evaluation of the zircon method of isotopic dating in the southern Arabian craton: Contributions to Mineralogy and Petrology, v. 68, p. 429-439.

177. Cosca, M.A., Shimron, A., Caby, R., 1999. Late Precambrian metamorphism and cooling in the Arabian–Nubian Shield. Petrology and 40Ar/39Ar geochronology of metamorphic rocks of the Elat area (southern Israel). Precambrian Research 98, 107–127.

178. El-Makhrouf, A.A. and Fullagar, P.D., 2000. The rubidium-strontium geochronology of the Pan-African post-orogenic granites of the eastern Tibisti orogenic belt, Tibisti Massif, South-central Libya: application to origin and tectonic evolution. In Geological Exploration in Murzuq Basin (pp. 379-395). Elsevier Science BV.

179. El-Makhrouf, A.A., 1984. Geology, Petrology, Geochemistry, and Geochronology of Eghei (Nugay) batholith alkali-rich granites, NE Tibesti, Libya. MSc thesis, University of North Carolina at Chapel Hill, 289p.

180. Schandelmeier, H., Richter, A. and Franz, G., 1983. Outline of the geology of magmatic and metamorphic units between Gebel Uweinat and Bir Safsaf (SW Egypt/NW Sudan). Journal of African Earth Sciences (1983), 1(3-4), pp.275-283.

181. Fleck, R.J., Hadley, D.G., 1985. Ages and Strontium Initial Ratios of Plutonic Rocks in a Transect of the Arabian Shield. Saudi Arabian Deputy Ministry for Mineral Resources Open-File Report USGS-OF-03-38, 43 p.

182. Hedge, C.E., 1984, Precambrian geochronology of part of northwestern Saudi Arabia: Saudi Arabian Deputy Ministry for Mineral Resources Open-File Report USGS-OF-04-31, 12 p.

183. Kusky, T., Matsah, M., 2003. Neoproterozoic Dextral Faulting on the Najd Fault System, Saudi Arabia, preceded sinistral faulting and escape tectonics related to closure of the Mozambique Ocean. In: Yoshida, M., Windley, B.F., Dasgupta, S., Powell, C. (Eds.), Proterozoic East Gondwana: Supercontinent Assembly and Breakup, vol. 206. Geological Society, London, Special Publication, pp. 327–361.

184. Lancelot, J.L.R. and Bosch, D., 1991. A Pan African age for the HP-HT granulite gneisses of Zabargad island: implications for the early stages of the Red Sea rifting. Earth and planetary science letters, 107(3-4), pp.539-549.

185. Radain, A.A., Ali, S., Nasseef, A.O., and Abdel-Monem, A.A., 1987, Rb-Sr geochronology and geochemistry of plutonic rocks from the Wadi Shuqub quadrangles, west-central Arabian shield: Journal of African Earth Sciences, v. 6, p. 553-568.

186. Ries, A.C., Shackleton, R.M. and Dawoud, A.S., 1985. Geochronology, geochemistry and tectonics of the NE Bayuda Desert, N Sudan: implications for the western margin of the late Proterozoic fold belt of NE Africa. Precambrian Research, 30(1), pp.43-62.

187. Stoeser, D.B., Stacey, J.S., Greenwood, W.R., and Fischer, L.B., 1984. U/Pb zircon geochronology of the southern part of the Nabitah mobile belt and Pan-African continental collision in the Saudi Arabian shield: Saudi Arabian Deputy Ministry for Mineral Resources Technical Record USGS-TR-04-5, 88 p.

188. Robinson, F.A., Pease, V., Whitehouse, M.J. and Kooijman, E., 2018. Preliminary detrital zircon signatures from the southern Asir terrane, Saudi Arabia: A link to Yemen or the Nubian Shield?. Precambrian Research, 311, pp.247-261.

189. Schürmann, H. M. E., 1974, The Precambrian in North Africa: E. J. Brill, Leiden, XVI+351 pp.+ 88 photographic plates+ 3 foldout maps in back pocket.

190. Blades, M., Collins, A., Foden, J., Payne, J., Xu, X., Alemu, T., Woldetinsae, G., Clark, C., Taylor, R., 2015. Age and Hafnium Isotopic Evolution of the Didesa and Kemashi Domains, Western Ethiopia. Precambrian Research. 270. 10.1016/j.precamres.2015.09.018.

191. Blades, M., 2013. The Age and the Origin of the Western Ethiopian Shield. The University of Adelaide, Honours Degree in Geology, 82 pp.

192. Yibas, B., Reimold, W.U., Armstrong, R., Koeberl, C., Anhaeusser, C.R., Phillips, D., 2002. The tectonostratigraphy, granitoid geochronology and geological evolution of the Precambrian of southern Ethiopia, Journal of African Earth Sciences, Volume 34, Issues 1–2, 57-84,

193. Avigad, D., Stern, R.J., Beyth, M., Miller, N. & McWilliams, M.O., 2007. Detrital zircon U–Pb geochronology of Cryogenian diamictites and Lower Paleozoic sandstone in Ethiopia (Tigrai): age constraints on Neoproterozoic glaciation and crustal evolution of the southern Arabian–Nubian Shield. Precambrian Research 154, 88–106.

194. Tadesse, T., Hoshino, M., Suzuki, K., Iizumi, S., 2000. Nd, Rb–Sr and Th–U–Pb zircon ages of syn- and post-tectonic granitoids from the Axum area of northern Ethiopia. J. Afr. Earth Sci. 30, 313–327.

195. Ghebreab, W., Talbot, C.J., Page, L., 2005. Time constrains on exhumation of the East African Orogen from field observations and 40Ar/39Ar cooling ages of low-angle mylonites in Eritrea, NE Africa. Precambrian Research 139, 20–41.

196. Grenne, T., Pedersen, R., Bjerkgård, T., Braathen, A., Selassie, M., Worku, T., 2003. Neoproterozoic evolution of Western Ethiopia: igneous geochemistry, isotopesystematics and U–Pb ages. Geol. Mag. 140, 373–395.

197. Johnson, T.E., Ayalew, T., Mogessie, A., Kruger, F.J., Poujol, M., 2004. Constraints on the tectonometamorphic evolution of the Western Ethiopian Shield. PrecambrianRes. 133, 305–327.

198. Asrat, A., Barbey, P., Ludden, J.N., Reisberg, L., Gleizes, G., Ayalew, D., 2004. Petrology and isotope geochemistry of the Pan-African Negash Pluton, Northern Ethiopia: Mafic-Felsic Magma Interactions during the Construction of Shallow-level Calc-alkaline Plutons. J. Petrol. 45, 1147–1179.

199. Ayalew, T., Bell, K., Moore, J.M., Parrish, R.R., 1990. U–Pb and Rb–Sr geochronology of the Western Ethiopian Shield. Geol. Soc. Am. Bull. 102, 1309–1316.

200. Mock, C., Arnaud, N.O., Cantagrel, J.-M., Yirgu, G., 1999. 40Ar/39Ar thermochronologyof the Ethiopian and Yemeni basements: reheating related to the Afar plume? Tectonophysics 314, 351–372.

201. Rogers, A., Miller, J.M., Mohr, P.A., 1965. Age determinations of some Ethiopian basement rocks. Nature 206, 1021–1026.

202. Miller, N.R., Alene, M., Sacci, R., Stern, R.J., Kröner, A., Conti, A., Zuppi, G., 2003. Significance of the Tambien Group (Tigrai, N. Ethiopia) for Snowball Earth Events in the Arabian–Nubian Shield. Precambrian Res. 121, 263–283.

203. Teklay, M., Kröner, A., Mezger, K., 2001. Geochemistry, geochronology and isotope geology of Nakfa intrusive rocks, northern Eritrea: products of a tectonically thickened Neoproterozoic arc crust. J. Afr. Earth Sci. 33, 283–301.

204. Teklay, M., Kröner, A. and Mezger, K. 2002. Enrichment from plume interaction in the generation of Neoproterozoic arc rocks in northern Eritrea: implications for crustal accretion in the southern Arabian-Nubian Shield. Chem. Geol., v. 184, pp. 167-184.

205. Teklay, M., Haile, T., Kröner, A., Asmerom, Y., Watson, J., 2003. A back-arc Paleotectonic setting for the Augaro Neoproterozoic magmatic rocks of western Eritrea. Gondwana Res. 6 (4), 629–640.

206. Kebede, T., Kloetzli, U.S., Koeberl, C., 2001. U/Pb and Pb/Pb zircon ages from granitoid rocks of Wallagga area: constraints on magmatic and tectonic evolution of Precambrian rocks of western Ethiopia. Mineral. Petrol. 71, 251–271.

207. Woldemichael, B.W., Kimura, J.-I., Dunkley, D.J., Tani, K., Ohira, H., 2010. SHRIMPU–Pb zircon geochronology and Sr–Nd isotopic systematic of the Neoproterozoic Ghimbi-Nedjo mafic to intermediate intrusions of western Ethiopia: a record of passive margin magmatism at 855 Ma? Int. J. Earth Sci. 99, 1773–1790.

208. Kebede, T., Horie, K., Hidaka, H., Terada, K., 2007. Zircon ‘microvein’ in peralkaline granitic gneiss, western Ethiopia: Origin, SHRIMP U–Pb geochronology and trace element investigations. Chemical Geology - CHEM GEOL. 242. 76-102. 10.1016/j.chemgeo.2007.03.014.

209. Gebreyohannes, G.W., 2014. Geology, geochemistry and geochronology of Neoproterozoic rocks in western Shire, Northern Ethiopia. Master Thesis in Geosciences Discipline: Geology of mineral resources Department of Geosciences Faculty of Mathematics and Natural Sciences University of Oslo. 75 pp.

210. Evuk, D.O., 2013, Geodynamic evolution of the central-eastern Bayuda Desert Basement, Sudan: structural, petrological, geochemical and geochronological investigations, Technische Universität Berlin, Doctoral Thesis, 193 pp.

211. Stern, R.J., 1994. Arc assembly and continental collision in the Neoproterozoic E African Orogen: implication for the consolidation of Gondwanaland. Annual Reviews of Earth Planetary Sciences 22, 319–351.

212. Andresen, A., Abu El-Enen, M. M., Stern, R. J., Wilde, S. A. & Ali, K. A., 2014. The Wadi Zaghra metasediments of Sinai, Egypt: new constraints on the late Cryogenian–Ediacaran tectonic evolution of the northernmost Arabian–Nubian Shield. International Geology Review 56, 1020–3

213. Be'eri-Shlevin, Y & Eyal, M., Eyal, Y., & Whitehouse, M. & Litvinovsky, B., 2012. The Sa'al volcano-sedimentary complex (Sinai, Egypt): A latest Mesoproterozoic volcanic arc in the northern Arabian Nubian Shield. Geology. 40. 403-406. 10.1130/G32788.1.

214. Akaad and Noweir, 1969, Lithostratigraphy of the Hammamat-Um Seleimat District, Eastern Desert, Egypt, Nature, v. 223, 284-285

215. Kazmin, V., Shifferaw, A., & Balcha, T., 1978. The Ethiopian basement: Stratigraphy and possible manner of evolution. Geologische Rundschau, 67(2), 531–546. doi:10.1007/bf01802803

216. Schmidt, D.L., Hadley, D.G., and Stoeser, D.B., 1979, Late Proterozoic crustal history of the Arabian Shield southern Najd province, Kingdom of Saudi Arabia: King Abdulaziz University Institute of Applied Geology Bulletin 3, v. 2, p. 41-58.

217. Klerkx, J., 1980. Age and metamorphic evolution of the basement complex around Jabal al Awaynat. In: M.J. Salem and M.T. Busrewil (Editors), The Geology of Libya. Academic, London, Vol. 3, 901-906.

218. Greenberg, J. K., 1981, Characteristics and origin of Egyptian ounger Granites: Summary, GSA Bulletin, v. 92(5), 224-232

219. Calvez, J.-Y., and Kemp, J., 1982, Geochronological investigations in the Mahd adh Dhahab quadrangle, central Arabian Shield: Saudi Arabian Deputy Ministry for Mineral Resources Technical Report BRGM-TR-02-5, 41 p.

220. Kemp, J., Gros, Y., and Prian, J.-P., 1982, Geologic map of the Mahd adh Dhahab quadrangle sheet 23E, Kingdom of Saudi Arabia: Saudi Arabian Deputy Ministry for Mineral Resources Geologic Map GM-64, scale 1:250,000, 39 p.

221. Warden, A.J., 1982, Reconnaissance geology of the Markas quadrangle, sheet 18/43B, Kingdom of Saudi Arabia: Saudi Arabian Deputy Ministry for Mineral Resources Open-File Report USGS-OF-02-41, 58 p.

222. Roobol, M.J., Ramsay, C.R., Jackson, N.J., and Darbyshire, D.P.F., 1983, Late Proterozoic lavas of the Central Arabian Shield – evolution of an ancient volcanic system: Journal of the Geological Society, London, v. 140, p. 185-202.

223. Huth, A., Franz, G. and Schandelmeier, H., 1984. Magmatic and metamorphic rocks of NW Sudan: a reconnaissance survey. Berliner Geowiss., Abh. (A), 50: 7-21.

224. Yassin, A. A., Khalil, F. A., and El Shafie, A. G., 1984, Explanatory note to the geological map at the scale of 1:2000000 of the Democratic Republic of the Sudan, The Ministry of Energy and Mining Geological & Mineral Resources Department, Bulletin no. 35, 62 pages + 1 map.

225. Fairer, G.M., 1985, Geologic map of the Wadi Baysh quadrangle, Sheet 17 F, Kingdom of Saudi Arabia: Saudi Arabian Deputy Ministry for Mineral Resources Geologic Map GM77, scale 1:250,000, 23 p.

226. Klemenic, P.M., 1985, Klemenic, P. M. (1985). New geochronological data on volcanic rocks from northeast Sudan and their implication for crustal evolution. Precambrian Research, 30(3), 263–276. doi:10.1016/0301-9268(85)90023-3

227. Agar, R.A., 1986, The Bani Ghayy group: sedimentation and volcanism in pull-apart grabens of the Najd strike-slip orogen, Saudi Arabian shield: Precambrian Research, v. 31, p. 257-274.

228. Richter, A., 1986. Geologie der metamorphen und magmatischen Einheiten im Gebiet zwischen Gebel Uweinat und Gebel Kamil-SW Ägypten/NW Sudan. Berliner Geowiss., Abh. (A), 73: 201.

229. Sahl, M., and Smith, J.W., 1986, Geologic map of the Al Muwayh quadrangle, sheet 22 E, Kingdom of Saudi Arabia: Saudi Arabian Deputy Ministry for Mineral Resources Geoscience Map GM-88, scale 1:250,000, 29 p.

230. Bemau, R., Darbyshire, D.P.F., Franz, G., Harms, U., Huth, A., Mansour, N., Pasteels, P. and Schandelmeier, H., 1987, Petrology, geochemistry and structural development of the Bir Safsaf-Aswan uplift/Southern Egypt. J. Afr. Earth Sci., 6(l): 79-90.

231. Thieme, J., 1988, Geologic map of the Jabal Khida quadrangle, sheet 21 G, Kingdom of Saudi Arabia: Saudi Arabian Directorate General of Mineral Resources Geologic Map GM 90, scale 1:250,000, 35 p.

232. Willis and Stern, 1988, Age and geochemistry of late Precambrian sediments of the Hammamar Series from the noerheastern deser of Egypt, Precambrian Research, v. 42, 173-187

233. Afifi, A.M., 1989, Geology of the Mahd adh Dhahab district, Kingdom of Saudi Arabia: Saudi Arabian Directorate General of Mineral Resources Open-File Report USGS-OF-09-2, 49 p.

234. Ghoneim, M. F., 1989, Mineral chemistry of some gabbroic rocks of the Central Eastern desert, Egypt, Journal of African Earth Sciences (and the Middle East), v. 9(2), 289-295.

235. Moore, T.A., and Ar-Rehaili, H., 1989, Geologic map of the Makkah quadrangle, sheet 21D, Kingdom of Saudi Arabia: Saudi Arabian Deputy Ministry for Mineral Resources Geoscience Map GM 107, 62 p.

236. Noweir, A. M., Sewifi, B. M., and Abu El Ela, A. M., 1990, Geology, petrpgraphy, geochemistry and petrogenesis of the Egyptian Younger Granites, Qatar Univ. Sci. Bull., v. 10, 363-393.

237. El-Mettwaly, A. A., Zalata, A. A. and Abu El-Enen, M. M., 1992, The evolution of the Pan-African granitoid rocks: geochemical evidences from SW Sinai massif, Egypt, Journal of African Earth Sciences (and the Middle East), v. 14 (1), 111-119.

238. Abdel-Karim, A. M., 1995, Late Precambrian Metagabbro-Diorite Complex from southwest Sinai, Egypt, Egypt. J. Geol., 39(2), 715-738

239. Holail, H. M. and Moghazi, A-K., M. (1998), Provenance, tectonic setting and geochemistry of greywackes and siltstones of the late Precambrian Hammamat Group, Egypt, Sedimentary Geology, v. 166, 227-250

240. Beyth, M., 2001, Preliminary indications for Snowball Earth in the East African Orogen: Geological Society of Australia Abstracts, v. 65.

241. Anderson, U.B., Ghebreab, W., Teklay, M., 2006. Crustal evolution and metamorphism in east central Eritrea, south-east Arabian–Nubian Shield. J. Afr. Earth Sci. 44, 45–65.

242. Eliwa, H. A., Kimura, J.-I., and Itaya, T., 2006, Late Neoproterozic Dokhan Volcanics, North Eastern Desert, Egypt: Geochemistry and petrogenesis, Precambrian Research, v. 151, 31-52.

243. Stern, R.J., Avigad, D., Miller, N.R., and Beyth, M., 2006, Evidence for the Snowball Earth hypothesis in the Arabian-Nubian shield and the East African Orogen: Journal of African Earth Sciences, v. 44, p. 1-20.

244. Schlüter, T., 2008, Geological Atlas of Africa with notes on stratigraphy, tectonics, economic geology, geohazards, geosites and geoscientific edication of each country, 2nd edition: Springer, Berlin, 308 pp.+1 CD-ROM

245. Hoffman, P.F., and Li, Z.-X., 2009, A palaeogeographic context for Neoproterozoic glaciation: Palaeogeography, Palaeoclimatology, Palaeoecology, v. 277, p. 158–172, doi:10.1016/j.palaeo.2009.03.013.

246. Miller, N. R., Stern, R. J., Avigad, D., Beyth, M., & Schilman, B., 2009. Cryogenian slate-carbonate sequences of the Tambien Group, Northern Ethiopia (I): Pre-"Sturtian" chemostratigraphy and regional correlations. Precambrian Research, 170(3-4), 129–156. doi:10.1016/j.precamres.2008.12.004

247. Miller, N. R., Avigad, D., Stern, R. J., & Beyth, M., 2011. Chapter 21 The Tambien Group, Northern Ethiopia (Tigre). Geological Society, London, Memoirs, 36(1), 263–276. doi:10.1144/m36.21

248. Abdel-Karim, A: M., El-Awady, A., Helmy, H., Al-Afandy, A. H., Sh Abdalla, 2011, Younger Gabbros from Egypt: a transition from tholeiitic to alkaline basaltic magma and form arc to wihtin plate rifting regime, The 6th Environmental Conference, Faculty of Science, Zagazih University, 194-220.

249. Azer, M. K. and El-Gharbawy, R. I., 2011, Contribution to the neoproterozoic layered mafic-ultramafic intrusion of galab Imleih, south Sinai, Egypt: implication of post-collisional magmatism in the north Arabian-Nubian shiled, J. African Earth Science, v. 60, 253-272.

250. Qaoud N, Abdelnasser A (2012) Geochemistry and petrogenesis of El-Fringa metagabbro-diorite rocks, Wadi Sa'al area, south Sinai, Egypt. J Azhar Univ-Gaza (Nat Sci) 14:111–138

251. Obaje, N. G., 2009, Geology and Mineral Resources of Nigeria: Springer, Berlin, xiv+221 pp.

252. Azer, M.K., Obeid, M.A. and Ren, M., 2014, Geochemistry and petrogenesis of late Ediacaran (605–580 Ma) post-collisional alkaline rocks from the Katherina ring complex, south Sinai, Egypt, J. of Asian Earth Science, v. 93, 229-252.

253. Evuk, D., Franz, G., Frei D. and Lucassen, F., 2014, The Neoproterezoic evolution of the central-eastern Bayuda Desert (Sudan), Precambrian Research, v. 240, 108-125

254. Flowerdew, M., Stoeser, D.B., and Whitehouse, M.J., 2004, The Nabitah fault zone: is it a suture between two ensimatic arcs? Abstracts; 32nd IGC – Florence

255. Swanson-Hysell, N. L., Maloof, A. C., Condon, D. J., Jenkin, G. R. T., Alene, M., Tremblay, M. M., Haileab, B., 2015. Stratigraphy and geochronology of the Tambien Group, Ethiopia: Evidence for globally synchronous carbon isotope change in the Neoproterozoic. Geology, 43(4), 323–326. doi:10.1130/g36347.1

256. Khedr, M. Z. and Arai, S., 2016a, Petrology of a neoproterozoic alaskan-type complex from the Eastern Desert of Egypt: implications for mantle heterogenity, Lithos, v. 263, 15-32.

257. Khedr, M. Z. and Arai, S., 2016b, Chemical variations of mineral inclusions in Neoproterozoic high-Cr chromitites from Egypt: evidence of fluids during chromitite genesis, Lithos, 240-243, 309-326.

258. MacLennan, S., Park, Y., Swanson-Hysell, N., Maloof, A., Schoene, B., Gebreslassie, M., Antilla, E., Tesema, T., Alene, M., and Haileab, B., 2018. The arc of the Snowball: U-Pb dates constrain the Islay anomaly and the initiation of the Sturtian glaciation. Geology, 46(6), 539–542. doi:10.1130/g40171.1

259. Kattan, F.H., and Harire, A.R., 2000, Geology of the Ad Duwayah-Bi'r Warshah mineral belt: Saudi Geological Survey Open-File Report USGS-OF-99-6, 33 p.

260. Said, R., editor, 1990, The Geology of Egypt: A. A. Balkema, Rotterdam, X+734 pp.

261. Dardir, A. A. and Abu Zeid, K. M., 1972. Geology of the basement rocks between latitudes 27°00' and 27°30'N, Eastern Desert, Ann. Geol. Surv. Egypt, v. 17, 19-35.

262. Bentor, Y. K., 1985. The crustal evolution of the Arabo-Nubian Massif with special reference to Sinai Peninsula. Precambrian Research, v. 28, 1-74.

263. Klerx, J., 1980. Age and metamorphic evolution of the Pan-African crystalline Basement complex around Jabal al Awaynat, In: Salem, M. J. and Busrewil, M. T. (Eds), The Geology of Libya, v. 3, 901-906.

264. Bernau, R., Darbyshire, D. P. F., Franz, G., Harms, U., Huth, A., Mansour, N., Pasteels, P. and Schandelmeier, H., 1987. Petrology, geochemistry and structural development of the Bir Safsaf-Aswan Uplift, Southern Egypt, Journal of African Earth Sciences, v. 6, 79-90.

265. Ogezi, A. E. O., 1977. Geochemistry and geochronology of basement rocks from northwestern Nigeria. Unpublished PhD thesis, Univ. of Leeds, England, pp. 295.

266. Caby, R., Andreopoulos-Renaud, U., Gravelle, M., 1982. Cadre geologique et geochronologique U/Pb sur zircon des batholites precoces dans le segment pan-africain du Hoggar central (Algerie). Bull. la Société Géologique Fr. S7-XXIV, 677–684. https://doi.org/10.2113/gssgfbull.S7-XXIV.4.677.

267. Caby, R., Dostal, J and Dupey, C., 1977. Upper Proterozoic greywackes from western Hoggar (Algeria). Geology and gepchemistry. Precambrian Research, v. 5, 283-297.

268. Chikhaoui, M., Dupuy, C. and Dostal, J., 1978. Geochemistry of late Proterozoic volcanic rocks from Tassendjanet area (NW Hoggar, Algeria). Contrib. Mineral. Petrol., v. 66: 157-164.

269. Caby, R. and Monié, P., 2003. Neoproterozoic subductions and differential exhumation of western Hoggar (southwest Algeria): new structural, petrological and geochronological evidence. J. Afr. Earth Sci. v. 37, 269–293.