

# Supplementary Material

**Table S1:** List of ground-dwelling beetles and their abundance along the rural-urban gradient in Wadi Hanifa, Riyadh, Saudi Arabia.

Family	Species	Code	Rural						Suburban						Urban						Total
			WHR1	WHR2	WHR3	WHR4	WHR5	WHR	WHS1	WHS2	WHS3	WHS4	WHS5	WHS	WHU1	WHU2	WHU3	WHU4	WHU5	WHU	
Anthicidae	<i>Anthelephila caeruleipennis</i> (La Ferté-Sénéctère, 1847)	SP1	0	0	0	1	0	1	0	0	0	0	0	0	4	34	50	210	32	330	331
Anthicidae	<i>Anthelephila ionica</i> (LaFerté-Sénéctère, 1849)	SP2	0	0	11	10	0	21	0	0	0	0	0	0	0	0	0	2	0	2	23
Anthicidae	<i>Anthelephila</i> sp.	SP3	0	0	0	0	0	0	0	0	1	0	0	1	0	0	3	0	0	3	4
Anthicidae	<i>Anthicus crinitus</i> LaFerté-Sénéctère, 1849	SP4	1	0	0	5	1	7	0	0	0	0	0	0	11	15	36	9	72	143	150
Anthicidae	<i>Endomia lefebvrei</i> (LaFerté-Sénéctère, 1849)	SP5	0	0	0	0	0	0	0	0	0	0	0	0	3	3	6	5	3	20	20
Anthicidae	<i>Omonadus floralis</i> (Linnaeus, 1758)	SP6	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	3	0	4	5
Carabidae	<i>Anthia duodecimguttata</i> Bonelli, 1813	SP7	0	2	1	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
Carabidae	<i>Apristus striatipennis</i> (Lucas, 1846)	SP8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Carabidae	<i>Bembidion wittmeri</i> (Basilewsky, 1979)	SP9	1	0	51	90	8	150	0	0	0	0	0	0	3	0	1	2	32	38	188
Carabidae	<i>Calosoma olivieri</i> Dejean, 1831_Sp	SP10	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Carabidae	<i>Eremolestes sulcatus</i> (Chaudoir, 1876)	SP11	0	0	1	1	1	3	0	0	0	0	0	0	0	0	0	0	0	0	3
Carabidae	<i>Masoreus wetterhallii</i> (Gyllenhal, 1813)	SP12	0	0	0	3	3	6	0	0	0	0	0	0	0	0	0	0	0	0	6
Carabidae	<i>Mesolestes quadriguttatus</i> (Mateu, 1979)	SP13	1	1	0	2	8	12	0	0	0	0	0	0	0	0	0	0	0	0	12
Carabidae	<i>Metadromius arabicus</i> Mateu, 1979	SP14	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
Carabidae	<i>Microlestes discoidalis</i> (Fairmaire, 1892)	SP15	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Carabidae	<i>Microlestes infuscatus</i> (Motschulsky, 1859)	SP16	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	0	5	5
Carabidae	<i>Stenolophus marginatus</i> Dejean, 1829	SP17	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Dermestidae	<i>Anthrenus malkini</i> Mroczkowski, 1980	SP19	0	0	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	2
Dermestidae	<i>Attagenus lobatus</i> Rosenhauer, 1856	SP20	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Dermestidae	<i>Attagenus lynx</i> (Mulsant et Rey, 1868)	SP21	2	4	2	0	0	8	0	8	0	0	6	14	0	0	0	0	0	0	22
Dermestidae	<i>Phradonoma nobile</i> (Reitter, 1881)	SP22	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2
Dermestidae	<i>Thorictus hanifahensis</i> Háva & Abdel-Dayem, 2021	SP24	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
Dermestidae	<i>Thorictus riyadhensis</i> Háva & Abdel-Dayem, 2021	SP23	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1

Elateridae	<i>Aeoloides grisescens</i> (Germar, 1844)	SP25	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	2
Elateridae	<i>Craspedostethus dilutus</i> (Erichson, 1840)	SP26	0	0	0	0	0	0	1	0	0	1	0	2	0	0	0	0	0	0	2
Elateridae	<i>Dicronychus brancuccii</i> Platia & Schimmel, 1997	SP27	0	0	0	7	1	8	0	0	0	1	1	2	0	0	0	0	0	0	10
Elateridae	<i>Dicronychus latifae</i> Al Dhafer & Platia, 2013	SP28	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
Elateridae	<i>Dicronychus</i> sp.	SP29	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Elateridae	<i>Dieronychus talhouki</i> Platia & Schimmel 1997	SP30	0	0	0	14	3	17	1	1	0	0	0	2	0	0	0	0	0	0	19
Elateridae	<i>Drasterius aegyptiacus</i> Buysson, 1905	SP31	0	0	0	0	0	0	0	0	0	0	0	0	3	0	16	0	0	19	19
Elateridae	<i>Heteroderes gallagheri</i> Platia & Schimmel, 1997	SP32	0	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Elateridae	<i>Heteroderes musculus</i> (Germar, 1844)	SP33	0	0	1	8	3	12	0	0	1	2	2	5	0	0	0	0	0	0	17
Elateridae	<i>Heteroderes omanensis</i> Platia & Schimmel, 1997	SP34	0	0	0	8	0	8	0	0	0	0	0	0	0	0	0	0	0	0	8
Elateridae	<i>Heteroderes ruteri</i> Chassain, 1979	SP35	0	2	17	53	7	79	0	0	1	7	3	11	0	0	0	0	0	0	90
Elateridae	<i>Heteroderes</i> sp.	SP36	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
Glaresidae	<i>Glaresis arabica</i> Paulian, 1980	SP52	1	0	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
Histeridae	<i>Atholus bimaculatus</i> (Linnaeus, 1758)	SP37	0	1	1	16	1	19	0	0	1	1	0	2	0	0	0	0	0	0	21
Histeridae	<i>Saprinus</i> sp.1	SP38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Histeridae	<i>Saprinus</i> sp.2	SP39	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Histeridae	<i>Saprinus</i> sp.3	SP40	0	1	0	4	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
Histeridae	<i>Saprinus</i> sp.4	SP41	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Histeridae	<i>Saprinus</i> sp.5	SP42	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Histeridae	<i>Saprinus</i> sp.6	SP43	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Histeridae	<i>Saprinus</i> sp.7	SP44	0	1	0	1	0	2	0	1	0	0	0	1	0	0	0	0	0	0	3
Scarabaeidae	<i>Ablaberoides abyssinicus</i> (Brenske, 1902)	SP45	0	0	15	0	1	16	0	0	0	0	0	0	0	0	0	0	0	0	16
Scarabaeidae	<i>Adoretus granulifrons</i> Fairmaire, 1882	SP46	0	0	0	0	0	0	0	0	0	7	0	7	0	0	0	0	0	0	7
Scarabaeidae	<i>Aphodius lividus</i> Olivier, 1789	SP47	0	1	0	0	0	1	0	0	0	0	0	0	7	0	0	1	0	8	9
Scarabaeidae	<i>Aphodius saoudi</i> Paulian, 1980	SP48	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Scarabaeidae	<i>Aphodius</i> sp.	SP49	0	1	0	3	2	6	0	2	0	0	0	2	0	0	0	0	0	0	8
Scarabaeidae	<i>Maladera insanabilis</i> (Brenske, 1894)	SP53	0	0	0	0	0	0	0	0	5	0	0	5	5	13	0	16	1	35	40
Scarabaeidae	<i>Onthophagus sellatus</i> Klug, 1845	SP54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
Scarabaeidae	<i>Pentodon algerinus</i> (Füessly, 1778)	SP55	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	3	3

Scarabaeidae	<i>Phaeadoritus iranicus</i> Machatschke, 1960	SP56	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	1	0	1	3
Scarabaeidae	<i>Platytomus yadai</i> (Ochi, Kawahara & Inagaki, 2006)	SP57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3
Scarabaeidae	<i>Rhyssesus saudi</i> Pittion, 1984	SP58	0	0	2	3	0	5	2	2	1	2	0	7	0	1	4	0	0	5	17
Scarabaeidae	<i>Scarabaeus cristatus</i> (Fabricius, 1775)	SP51	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Scarabaeidae	<i>Schizonycha</i> sp.	SP59	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Scarabaeidae	<i>Sphaerotrochalus</i> sp.	SP60	0	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
Tenebrionidae	<i>Adelostoma subtile</i> Reitter, 1900	SP61	1	9	5	5	0	20	1	0	1	0	0	2	0	0	0	0	0	0	22
Tenebrionidae	<i>Adesmia cancellata</i> Solier, 1835	SP62	3	7	9	8	8	35	44	11	14	21	16	106	1	0	0	0	0	1	142
Tenebrionidae	<i>Adesmia stoeckleini</i> Koch, 1940	SP63	151	2	24	15	15	207	0	0	0	0	5	5	0	0	0	0	0	0	212
Tenebrionidae	<i>Akis spinosa</i> (Linnaeus, 1764)	SP64	1	37	5	1	0	44	0	0	0	0	0	0	0	0	0	0	0	0	44
Tenebrionidae	<i>Apentanodes arabicus</i> (Kirchsberg, 877)	SP65	0	0	3	0	0	3	0	0	2	1	6	9	0	0	0	0	0	0	12
Tenebrionidae	<i>Blaps kollari kollari</i> Seidlitz, 1896	SP66	0	3	3	2	4	12	0	0	0	0	0	0	0	0	0	0	0	0	12
Tenebrionidae	<i>Cheirodes brevicollis</i> Wollaston, 1864	SP67	0	0	1	0	0	1	0	0	1	1	0	2	0	0	0	0	0	0	3
Tenebrionidae	<i>Cheirodes sardous</i> Gené, 1839	SP68	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
Tenebrionidae	<i>Erodium servillei</i> Solier, 1834	SP69	0	0	0	0	0	0	0	3	2	0	1	6	0	1	0	0	0	1	7
Tenebrionidae	<i>Gonocephalum besnardi</i> Kaszab, 1982	SP70	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	3	3
Tenebrionidae	<i>Gonocephalum patruale</i> (Erichson, 1843)	SP71	0	18	5	5	0	28	0	0	0	0	0	0	0	3	1	2	9	15	43
Tenebrionidae	<i>Gonocephalum prolixum</i> (Erichson, 1843)	SP72	0	7	25	41	1	74	0	0	0	0	0	0	34	1	4	6	11	56	130
Tenebrionidae	<i>Gonocephalum rusticum</i> (Olivier, 1811)	SP73	0	0	1	0	0	1	2	0	0	0	0	2	9	6	23	9	22	69	72
Tenebrionidae	<i>Gonocephalum setulosum</i> (Fladermann, 1837)	SP74	0	0	0	0	6	6	0	0	0	3	0	3	0	0	1	0	0	1	10
Tenebrionidae	<i>Gonocephalum soricinum</i> (Reiche & Saulcy, 1857)	SP75	0	0	1	3	2	6	6	2	2	1	0	11	0	0	0	0	0	0	17
Tenebrionidae	<i>Mesostena puncticolis</i> Solier, 1835	SP76	10	26	9	25	59	129	94	38	34	45	47	258	0	2	0	1	2	5	392
Tenebrionidae	<i>Micipsa arabica</i> Kaszab, 1981	SP77	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Tenebrionidae	<i>Microdera marginata evansi</i> Blair, 1923	SP78	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
Tenebrionidae	<i>Mycetocharina vanharteni</i> Novák, 2008	SP79	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Tenebrionidae	<i>Opatroides punctulatus</i> Brullé, 1832	SP80	0	0	1	1	0	2	0	0	0	0	0	0	0	0	0	4	0	4	6
Tenebrionidae	<i>Opatroides vicinus</i> (Fairmaire, 1896)	SP81	0	1	1	2	2	6	0	0	0	0	0	0	0	3	0	1	0	4	10
Tenebrionidae	<i>Oxycara saudarabica</i> Kaszab, 1979	SP82	8	2	4	8	9	31	0	5	3	4	16	28	0	0	0	0	0	0	59
Tenebrionidae	<i>Pimelia nazarenoides</i> Kaszab, 1982	SP83	0	0	1	1	0	2	0	1	1	2	3	7	0	0	0	0	0	0	9

Tenebrionidae	<i>Pimelia thomasi thomasi</i> Blair, 1931	SP84	0	0	0	0	0	0	0	2	2	2	0	6	0	0	0	0	0	0	6
Tenebrionidae	<i>Platynomus</i> sp.	SP85	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Tenebrionidae	<i>Scleropatroides</i> sp.	SP86	0	1	8	8	1	18	0	0	0	0	0	0	0	0	0	0	0	0	18
Tenebrionidae	<i>Sclerum orientalis</i> (Fabricius, 1775)	SP87	0	0	0	0	0	0	0	0	0	0	0	0	3	1	1	0	1	6	6
Tenebrionidae	<i>Sclerum sulcatum</i> Baudi, 1876	SP88	0	0	0	0	0	0	0	1	0	0	1	2	0	0	0	0	0	0	2
Tenebrionidae	<i>Sepidium tricuspidatum</i> Fabricius, 1775	SP89	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Tenebrionidae	<i>Tentyrina deserta deserta</i> Kaszab, 1981	SP90	2	9	1	1	0	13	6	3	4	5	9	27	0	0	0	0	0	0	40
Tenebrionidae	<i>Tentyrina palmeri</i> (Crotch, 1872)	SP91	0	0	0	0	0	0	2	2	0	0	0	4	0	0	0	0	0	0	4
Tenebrionidae	<i>Thraustocolus arabicus</i> Kaszab, 1979	SP92	1	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	2
Tenebrionidae	<i>Thriptera kraatzii</i> (Haag-Rutenberg, 1876)	SP93	2	2	13	19	3	39	0	0	3	0	0	3	0	0	2	4	5	11	53
Tenebrionidae	<i>Trachyderma philistina</i> Reiche & Saulcy, 1857	SP94	8	11	23	19	6	67	11	3	2	6	6	28	0	0	0	1	0	1	96
Tenebrionidae	<i>Zophosis complanata</i> Solier, 1834	SP18	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Tenebrionidae	<i>Zophosis punctata</i> Brullé , 1832	SP95	0	0	0	0	0	0	76	13	95	28	25	237	0	0	0	0	0	0	237