



Biological explorations of Sinai: flora and fauna of Wadi Isla and Hebran, St Katherine Protectorate, Egypt

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Abstract

A comprehensive survey was accomplished for two of the most important and beautiful wadis in the Sinai, Wadi Isla & Hebran. The biodiversity of the two wadis are surveyed including plant species and their associated insects, spiders and scorpions. The list includes 20 plant families with 51 species, 8 insect orders with 54 families and 138 species, and 4 arachnid orders with 17 families and 23 species. The highest number of species recorded were Coleoptera and Hymenoptera.

Keywords: Biodiversity, checklist, plants, insects, spiders

Introduction

The mountainous region of southern Sinai probably contains a greater biodiversity than in the rest of Egypt. A large section of the area was declared a Protectorate in 1996, centered upon the town of St Katherine (altitude 1600 m) with its world-famous 6th century monastery built on the traditional site of the 'burning bush' of the Bible, at the foot of Mt Sinai. From the mountain of St Katherine, at 2641 m the highest point in Egypt and marking the watershed of the peninsula, wadi systems drain eastwards towards the Gulf of Aqaba, and westwards towards the Gulf of Suez. Although southern Sinai is classified as 'very arid' (Zahran & Willis, 1992), there is in fact a great deal of water draining down the wadis, sometimes as violent and destructive flash floods, but under normal circumstances most of the water is underground, occasionally surfacing to produce short sections of freely flowing permanent water. Sparse vegetation occurs everywhere, but the wet areas are particularly rich with plants and consequently with insects and other animals.

Because of the recent political history of the Sinai, little is known about the fine detail of the distributions of the different taxa. Such detail is vital in the rational planning of the management of the Park, especially in the light of the position of the monastery and the importance of tourism to the economy of Egypt. The rich biodiversity of the Park is exemplified by the butterflies (67% of the 60 species of Egypt, including two endemics: Larsen 1990, Gilbert & Zalata 2008) and the plants (estimates vary, but a figure of 450 has been quoted with more than 30 endemics, see Boulos 1998-2004). This report documents an expedition to record and map the biodiversity of insects and their associations with plants within the St Katherine Protectorate. We chose to concentrate upon Wadi Isla, a traditional camel route between the regional capital on the Red Sea coast, El Tur, and the town of St Catherine. Wadi Isla opens onto the Plain of El Qa'a, a wide and gently sloping plain separating the mountains from the Red Sea (Map 1). The wadi is well known amongst the local Bedouin for its rich water resources, but rather few biologists have visited it: we know only of some entomologists (Alfieri, Efflatoun, Zalata); occasional records of collected insects show that some others have also been in the wadi (e.g. Dumont 1991; Theodor 1980, Freidberg & Kugler 1989). We returned to St Catherine via Wadi Hebran, a wadi which runs parallel to but north of Wadi Isla,

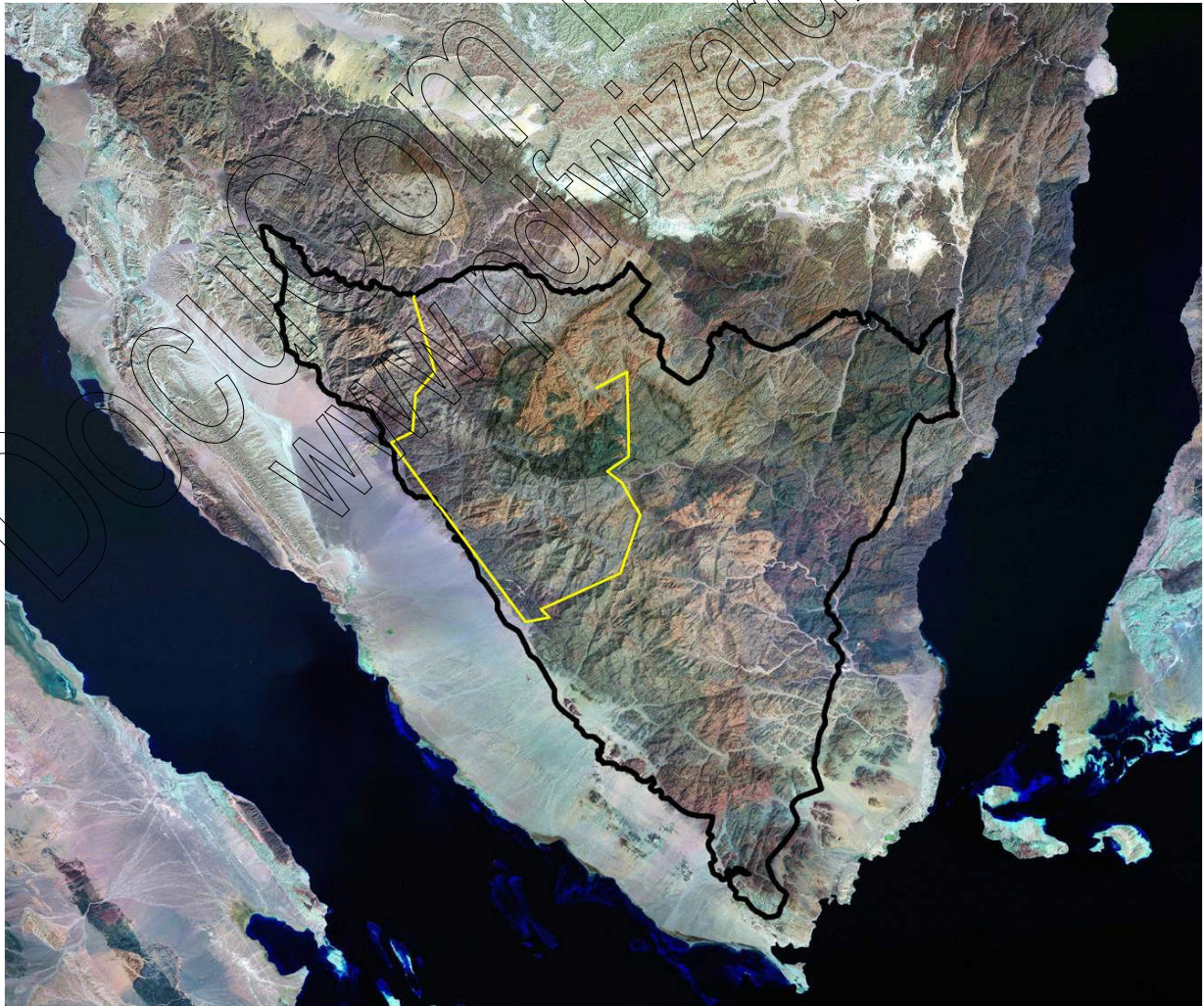
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and which also opens onto the Plain of El Qa'a: Wadi Hebran is equally poorly known entomologically.

Methods

The expedition lasted nine days between 31st July and 8th August 1994. Each day was spent either walking along the wadi, collecting arthropods from under stones, or by sweeping or beating plants, or by collecting visitors of flowers. At certain places in Wadi Isla we spent whole days observing flowers of *Mentha lavandulacea* Willd. (Labiatae) as part of a more specialized study of the insect-plant interactions of this plant. All specimens were preserved in ethyl acetate vapor before pinning on return, and voucher specimens of all taxa are lodged at the collection of the Environmental Research Center (ERC) of Suez Canal University situated in the town of St Catherine. At each camp site we took our position using a hand-held GPS receiver (Trimble Ensign, Trimble Navigation UK LTD, UK) accurate to ± 200 m, given enough satellites in the right places; 3-dimensional accuracy is measured by the Positional Dilution of Precision (PDOP) which depends on the number of geometry of the satellites. The full names of all the plants and insects we recorded are given in Table 1 and Table 2 respectively. The route of the expedition is shown on Fig 1. Plants names follow Boulos (1998-2004).

Fig 1: Map of southern Sinai, with the boundary of the St Katherine Protectorate (black) and the route of the expedition (yellow) southwest down Wadi Isla, north-west along the boundary of the mountains with the Plain of El Qa'a, and up Wadi Hebran.



Results

Day 1: We were taken by Land Rover from Suez Canal University's Environmental Research Center at St Catherine to the plain of El Rahaba, a wide plain surrounded by low hills and mountainous ridges. This plain has no running water at any time except during flash floods, but nevertheless there is a great deal of vegetation, dominated by *Seriphidium herba-alba* and to a lesser extent *Artemisia judaica*, *Achillea fragrantissimum* and *Zilla spinosa*; *Peganum harmala* and *Fagonia tristis* are also frequent.

From here we were joined by three camels and a Bedouin guide from the Awlad Ali, Hussein No'man, skilled at identifying plants. We then crossed over into the Wadi Isla drainage system, which at this point is called Wadi Tarafa. Again the dominant plants are *Seriphidium herba-alba*, *Peganum harmala*, *Zilla spinosa* and *Fagonia tristis*. Also encountered were *Raetam raetam*, *Alkanna orientalis*, *Stachys aegyptiaca*, *Hyoscyamus boveanus*, *Tamarix aphylla*, *Gomphocarpus sinaicus*, *Teucrium polium*, *Micromeria sinaica*, *Zygophyllum album*, *Reaumuria hirtella*, *Acacia tortilis raddiana*, date palms *Phoenix dactylifera*, and wild figs *Ficus pseudosycomorus*. In addition we recorded *Euphorbia obovata*, a rare Sinai endemic classified as endangered (Gamal El Din 1992) which, according to our guide, only occurs in the Rahaba area. We camped at 28° 23' 37.2" N, 34° 00' 40.5" E at an altitude of 1530 m (PDOP = 2.8, n = 6 satellites).

Day 2. The next day was spent walking down Wadi Tarafa, through Wadi Zeliga, to Wadi Orma, all part of the Wadi Isla drainage system; we camped at the junction between Wadi Zeliga and Wadi Orma at 28° 18' 35.0" N, 33° 59' 3.2" E, at an altitude of 870 m (PDOP = 3.2, n = 5 satellites). Wadi Tarafa is dominated by *Zilla spinosa*, *Pulicaria undulata*, *Artemisia judaica* and *Seriphidium herba-alba*, and others as before, but there are small patches of *Mentha lavandulacea*; *Hyoscyamus boveanus* begins to be abundant, and there are increasing numbers of the two species of *Capparis*, *C. sinaica* being more common than *C. spinosa*. Some of the large red edible fruits of *C. sinaica* were infested with insect larvae, probably Diptera. As is common with many Sinai plants, only a few flowers of *C. sinaica* bloom each day and all stages from flower to dehiscent fruit are present on the same plant; flowers last only a single day, and wither rapidly during the day of opening.

Other plants recorded this day were *Ephedra*, two species of *Cleome* (*africana* and *droserifolia*), *Reseda unigera*, *Cayusea hexagyna*, *Pulicaria incisa*, *Trichodesma africanum*, *Launaea spinosa*, *Ochradenus baccatus*, *Zygophyllum coccineum*, *Otostegia fruticosa* and *Chiliadenus montanus*. Five female ibex (*Capra nubiana*) were seen climbing rapidly over the ridge of Wadi Zeliga.

Day 3. This consisted of walking from Wadi Orma, and down Wadi Isla proper which, according to our guide, starts at a large grove of bamboo where Wadi Om Arad joins the main wadi. The dominant plants here are both species of *Capparis*, *Raetam raetam*, and *Hyoscyamus boveanus*. Also common are *Calotropis procera*, *Pulicaria undulata* and, increasingly, *Pulicaria incisa*. Other plants recorded were *Cleome droserifolia*, *Acacia tortilis raddiana*, *Seriphidium herb-alba*, *Ochradenus baccatus*, *Ficus pseudosycomorus* and *Zilla spinosa*. The abundance of *Seriphidium* and *Zilla* declined, and we could find no *Reaumuria*. In Wadi Om Arad we found *Echinops spinosissimum* close to the large deep pools of water at the mouth of that steep wadi.

The density of bamboo thickets is quite remarkable in places, especially at the end of the day's journey close to where we finally camped, at the mouth of Wadi Moagid (at 28° 16' 22.0" N, 33° 54' 19.6" E, altitude 630m, PDOP = 2.9, n =5 satellites). At this point the bamboo grows in a site with a large amount of running surface water on the wadi bed; in the densest region the path leads under overarching bamboo thickets and through dense stands of *Mentha*

lavandulacea. There were many camel ticks in this site, sitting on the inflorescences with front legs held open, waiting for passing animals on which to mount.

In Wadi Isla at this point, the main plants are bamboo (*Phragmites* sp.), *Pulicaria undulata*, *Zygophyllum album*, *Mentha lavandulacea*, and *Juncus rigidus*. Other obvious plants are *Fagonia tristis*, *Capparis spinosa*, *Acacia tortilis raddiana*, *Raetam raetam*, *Cleome droserifolia*, *Phoenix dactylifera*, *Echinops spinosissimum* and *Chrozophora oblongifolia*.

Day 4. was spent censusing insect visitors to *Mentha* in two places in Wadi Isla close to the junction with Wadi Moagid.

Day 5. was spent censusing visitors to *Mentha* in Wadi Isla and Wadi Moagid. The latter wadi has a lot of running water near its junction with Wadi Isla, and the dominant plants are *Mentha lavandulacea*, *Typha domingensis*, *Phragmites* sp, *Pulicaria undulata*, *Pulicaria incisa* and *Hyoscyamus boveanus*. Other plants present are *Solanum nigrum*, *Capparis spinosa*, *C. sinaica*, *Fagonia tristis*, *Zilla spinosa*, *Raetam raetam*, *Reseda urnigera*, and *Phoenix dactylifera*.

In the late afternoon, we moved 2 km further down Wadi Isla, through a spectacular narrow gorge only 4-5 m wide. This gorge is rocky, very steep-sided, and full of running water and some accompanying plants (dominated by *Mentha*). According to our Bedouin guide, the vegetation is regularly swept away in spectacular flash floods which, in this narrow gorge, reach 6 m depth. Our camp site was at 28° 15' 2.5" N, 33° 55' 11.3" E; the narrowness of the valley meant that only three satellites were received by the GPS (PDOP = 2.9) and therefore it could not estimate our altitude.

Day 6. was spent censusing visitors to *Mentha*, and again in the late afternoon we moved to our final camp site in Wadi Isla close to the mouth at El Qa'a plain.

Day 7. We walked to the Bedouin settlement at the mouth of Wadi Isla, resting there until 1800. Overnight we walked north-west across the plain of El Qa'a skirting the edge of the mountains, past successive mouths of wadis Imleha, Shediq, Wagran, Mi'r, and finally to reach Wadi Hebran in the early morning (about 28° 23' N, 33° 42' E).

Day 8. We walked 4 km up Wadi Hebran to a camp site at 28° 31' 21.3" N, 33° 41' 35.1" E, at an altitude of 480 m (PDOP = 5.2, n = 5 satellites). There is a great deal of water in this short (± 1 km) section near the mouth, and dense vegetation including an avenue of continuous *Mentha lavandulacea*, many date palms (*Phoenix dactylifera*) and a great deal of *Juncus rigidus*. The *Mentha* at this point is much denser than in Wadi Isla. *Pulicaria undulata* is also dominant. We also identified *Zilla spinosa*, *Acacia tortilis raddiana*, *Cleome droserifolia*, *Citrullus colocynthis*, two species of *Zygophyllum* (*album* and *simplex*), *Hyoscyamus boveanus* and *Zosima absinthifolia*.

Day 9. consisted of the walk up Wadi Hebran to the head of the wadi, into Wadi El-Ghotiah and over the mountain trail into Wadi Solaf. Apart from one well at about the mid-point, the whole of the rest of Wadi Hebran was without water; the dominant plant was undoubtedly *Acacia tortilis raddiana*, with date palms *Phoenix dactylifera* in the area of the well. *Raetam raetam* was absent, but present in Wadi El-Ghotiah. Wadi Solaf was the end of the expedition, and from there we returned to St Catherine.

Table 1: The recorded plants

Scientific Name	Vernacular Name	Arabic Name
Asclepiadaceae		
<i>Calotropis procera</i> (Ait.) Ait	Oshar	عشار
<i>Gomphocarpus sinaicus</i> Boiss	Hargal	حرجل
Boraginaceae		
<i>Alkanna orientalis</i> (L.) Boiss	Lobbeid	لوبيد
<i>Trichodesma africanum</i> (L.) R.Br.	Hameima	حميمة
Capparaceae		

<i>Capparis spinosa</i> L.	Lasooif	لصوف
<i>Capparis sinaica</i> Duhamel	Lasaf	لصف
Cleomaceae		
<i>Cleome africana</i> Botsch.	Maganena	مجانينا
<i>Cleome droserifolia</i> (Forssk.) Del.		
Compositae		
<i>Achillea fragrantissimum</i> (Frossk.)	Qaysoom	قيصوم
<i>Seriphidium herba-alba</i> (Asso) Sojak	Sheeh	شيع
<i>Artemisia judaica</i> L.	Sheeh	شيع
<i>Centaurea scoparia</i> Sieber	Borkana	بركانة
<i>Echinops spinosissimus</i> Turra.	Khosheer	خشير
<i>Launaea spinosa</i> (Forssk.) Sch.Bip.	Kebathah	كبائة
<i>Pulicaria incisa candolleana</i> G. Eldin		
<i>Pulicaria undulata</i> (L.) May.	Rablah	ربلة
<i>Chiliadenus montana</i> (Vahl.) Brullo.	Neheda	نهيدة
Cruciferae		
<i>Moricandia nitens</i> (Viv.)	Khasw el gamal	خسو الجمل
<i>Zilla spinosa</i> (Turra) Prantl	Thela	ثلة
Cucurbitaceae		
<i>Citrullus colocynthis</i> (L.) Schrad.	Hazal	حنظل
<i>Cucumis prophetarum</i> Jusl. ap L.	Hanzalaan	حنظلان
Ephedraceae		
<i>Ephedra aphylla</i> Forssk.	Algan	علجان
Euphorbiaceae		
<i>Chrozophora tinctoria</i> (L.) Raf.	Sammo	سمو
<i>Chrozophora oblongifolia</i> (Delile) Spreng.		
<i>Euphorbia obovata</i> Decne.	Om el Bena	أم البينة
Juncaeae		
<i>Juncus rigidus</i> Desf.	Dees	ديس
Labiatae		
<i>Lavandula pubescens</i> Decne	Zeita	زيبطة
<i>Mentha lavandulacea</i> Willd.	Habaq	حيج
<i>Micromeria sinaica</i> Benth.	Khassah	خسو
<i>Otostegia fruticosa</i> (Forssk.) Brig.	Sharna	شرامة
<i>Stachys aegyptiaca</i> Pers.	Qortom	قرطم
<i>Teucrium polium</i> L. s.l. <i>T. leucocladum</i>	Gada	جعدة
Leguminosae		
<i>Astragalus</i> sp.		
<i>Acacia tortilis raddiana</i> (Savi.) Brenan	Sayaal	سيال
<i>Raetam raetam</i> (Forssk.) Heywood	Rataam	رتم
Moraceae		
<i>Ficus pseudosycomorus</i> Decne.	Hamaat	حماط
Palmae		
<i>Phoenix dactylifera</i> L.	Nakal	نخل
Resedaceae		
<i>Caylusea hexagyna</i> (Forssk.)	Zenaba	زنابطة
<i>Ochradenus baccatus</i> Del.	Qardi	قردي
<i>Reseda urnigera</i> Webb	Khesaama	خزامة
Solanaceae		
<i>Hyoscyamus boveanus</i> (Dun.)	Sakraan	سكراان
<i>Solanum nigrum</i> L.	Enabah	عناطة
Tamaricaceae		
<i>Reaumuria hirtella</i> Jaub. et Sp.	Melliha	مليحة
<i>Tamarix aphylla</i> (L.) Karst	Athl	أتل
Typhaceae		
<i>Typha domingensis</i> (Pers.) Poir.	Bardi	بردي
Umbelliferae		
<i>Deverra tortuosa</i> (Desf.) DC		
<i>Zozima absinthifolia</i> (Vent.) DC	Amiya	أميا
Zygophyllaceae		
<i>Fagonia tristis</i> Sickenb.	Waraqa	وراقة

<i>Peganum harmala</i> L.	Harmal	حرمال
<i>Zygophyllum album</i> L.	Rotreyt	رطريط
<i>Zygophyllum coccineum</i> L.	Qalama	قلامة
<i>Zygophyllum simplex</i> L.	Qarmal	قرمل

Table 2: The Insects recorded

Coleoptera

Alleculidae	<i>Mycetocharina megalops</i> Fairm.
Anthicidae	<i>Formicomus</i> sp. (3 species on <i>Mentha</i>)
Buprestidae	<i>Anthaxia</i> sp. <i>Psiloptera mimosae</i> (Klug) <i>viridis</i> <i>Prychomus politus</i> (Klug) on <i>Acacia</i>
Carabidae	<i>Abacetus quadripustulatus</i> Peyer <i>Bembidion</i> sp. <i>Chlaenius canariensis seminitidus</i> Chd <i>Pheropsophus africanus</i> Dej. <i>Scarites sinaiticus</i> Schatz <i>Stenolophus abdominalis</i> Gene
Cerambycidae	<i>Crossotus</i> sp. (on <i>Acacia</i> in W. Isla)
Chrysomelidae	<i>Cryptocephalus</i> sp.
Coccinellidae	<i>Coccinella undecimpunctata</i> (on <i>Mentha</i>) <i>Epilachna chysomelina orientalis</i> Zimm (on <i>Cucumis prophetarum</i> Jusl.).
Curculionidae	<i>Apion alfieri</i> Pic. <i>Coniatus aegyptiacus</i> Cap. <i>Cylindropterus luxeri</i> Chvr. <i>Lixus</i> spp. (2 species).
Dermestidae	<i>Attagenus</i> sp. (on the ground). <i>Anthrenus coloratus</i> (on Umbelliferae).
Dryopidae	<i>Dryops luridus</i> (Erichsen) (aquatic in all wadis)
Dytiscidae	<i>Aglymbus gestroi</i> Sharp <i>Cybister tripunctatus</i> (Olivier) <i>africanus</i> (Laporte de Castelnau) <i>Deronectes arabicus</i> Sharp <i>Deronectes schweinfurthii</i> Zimm. <i>Eretes sticticus</i> Steph <i>Hydaticus decorus</i> Klug <i>Hydaticus leanderi</i> Rossi <i>Hydroglyphus major</i> (Sharp) <i>Hydrovatus cuspidatus</i> (Kunze) <i>Hyphidrus</i> sp. <i>Nebrioporus walkeri</i> (van den Branden) <i>Nebrioporus lanceolatus</i> (Walker) <i>Nebrioporus insignis</i> (Klug) <i>Rhantus pulverosus</i> Steph
Elateridae	<i>Caradiophorus dilutus</i> Er.
Gyrinidae	<i>Dineutes grandis</i> Klug
Hydrophilidae	<i>Enochrus bicolor</i> (Fabr.) <i>Loccobius sinuatus</i> Motsch. <i>Spercheus cerisyi</i> (Guérin-Ménéville)
Melyridae	<i>Melyris sinaita</i> Pic
Trogossitidae	<i>Tenebroides mauritanicus</i> L.
Scarabaeidae	<i>Onthophagus sellatus</i> Klug <i>Phyllognathus excavatus</i> Forst.
Staphylinidae	<i>Philonthus</i> sp.
Tenebrionidae	<i>Adesmia sinaitica</i> Croten <i>Mesomorphus</i> sp. <i>Mesostenena angustata</i> F. <i>Mesostenopa cavatica</i> Andres <i>Ocnera hispida</i> Forskal <i>Ocnera philistina</i> Reiche

	<i>Opatroides punctatus</i> Brulle
	<i>Tentyria sinaitica</i> Sol.
Dictyoptera	
Blattidae	<i>Polyphaga aegyptiaca</i> L.
Mantidae	<i>Eremiaphila</i> sp.
Diptera	
Asilidae	<i>Promachus</i> sp.
Bombyliidae	<i>Exoprosopa aegina</i> Wied.
	<i>Pterobates chalybaea</i> (von Röder) [new record for Egypt, reported in the 1999 World Catalog by Greathead]
	<i>Spogostylum isis</i> Meigen
	<i>Spogostylum ocyale</i> Wiedemann
Calliphoridae	<i>Chrysomyia albiceps</i> Wied.
Conopidae	<i>Conops flavicaudus</i> Bigot
	<i>Physocephala pusilla</i> Meigen
Otitidae	<i>Physiphora demandata</i> Fabr.
Stratiomyidae	<i>Odontomyia</i> sp.
Tabanidae	<i>Tabanus</i> spp. (2 species).
Trypetidae	<i>Trypanea nostrata</i> Hendel
Heteroptera	
Anthocoridae	<i>Orius laevigatus</i> (Fieber)
Belostomatidae	<i>Lethocerus niloticus</i> (Stål)
	<i>Sphaerodema urinator</i> (Dufour)
Corixidae	<i>Sigara</i> spp. (2 species).
Lygaeidae	<i>Nysius cynoides</i> (Spin.)
	<i>Spilostethus longulus</i> Dall.
Miridae	<i>Creontiades</i> sp.
Nepidae	<i>Laccotrephus fabricii</i> Stål
Pentatomidae	<i>Aspongopus viduatus unicolor</i> H.S.
	<i>Bagrada amoenula</i> Horv.
	<i>Scotocoris conspurcatus</i> Klug
	<i>Ventocoris obsesus</i> (Stål)
Rhopalidae	<i>Liorhyssus hyacinus</i> (Fabr.)
Tingidae	<i>Copium</i> sp (only one species in Egypt, <i>teucris</i> Host)
Homoptera	
Membracidae	<i>Sangronoidea</i> sp.
Hymenoptera	
Anthophoridae	<i>Anthophora albigena afra</i> Priesner
	<i>Xylocopa pubescens</i> Spinola
	<i>Xylocopa sulcatipes</i> Maa
Eumenidae	<i>Delta asina mixtum</i> (Giordani Soika) [recorded for Egypt by Giordani Soika, but this is the first Egyptian specimen]
	<i>Delta dimidiatipenne</i> (Saussure)
	<i>Delta hottentottum elegans</i> (Saussure)
	<i>Euodynerus stigma</i> (Saussure)
	<i>Rhynchium cyanopterum</i> (Saussure)
Formicidae	<i>Camponotus cognatocompressus</i> Forel
	<i>Monomorium</i> sp.
Masaridae	<i>Quartinia</i> sp.
Megachilidae	<i>Anthidium</i> sp1
	<i>Anthidium</i> sp2
	<i>Chalicodoma maxillosa</i> (Guerin)
	<i>Megachile submucida</i> Alfken
Pompilidae	<i>Ctenagenia vespiformis</i> Klug
Sapygidae	<i>Sapyga</i> sp.
Scoliidae	<i>Dielis collaris</i> (Fabr.)
	<i>Scolia erythrocephala</i> Fabr.
Sphecidae	<i>Bembix dahlbomi</i> Handlirsch
	<i>Bembix oculata</i> Panzer

	<i>Bembix olivacea</i> Fabr.
	<i>Bembix rufiventris</i> Priesner
	<i>Cerceris fisheri</i> Spinola
	<i>Cerceris sabulosa</i> (Panzer)
	<i>Chlorion hirtum</i> (Kohl)
	<i>Chalybion flebile</i> (Lepeletier)
	<i>Liris</i> sp.
	<i>Philanthus coarctatus</i> Spinola
	<i>Philanthus</i> sp
	<i>Philanthus</i> sp
	<i>Podalonia tydei</i> (Le Guillou)
	<i>Prionyx crudalis</i> (F. Smith)
	<i>Prionyx judaeus</i> (de Beaumont)
	<i>Prionyx niveatus</i> (Dufour)
	<i>Prionyx subfuscatus</i> (Dahlbom)
	<i>Prionyx viduatus</i> (Christ)
	<i>Sphex fumicatus</i> Christ
	<i>Stizus</i> sp1 (coloured like <i>Bembix</i>)
	<i>Stizus marthae</i> Handlirsch
	<i>Stizus fuscatus</i> Morice
	<i>Stizus savignyi</i> Spinola
	<i>Tachysphex</i> sp1
	<i>Tachysphex</i> sp2
	<i>Vespa orientalis</i> L.
Vespidae	
Lepidoptera	
Nymphalidae	<i>Vanessa cardui</i> L.
Pieridae	<i>Euchloe glauconome</i> Ob.
	<i>Colotis fausta</i> Oliv.
Satyridae	<i>Pseudotergumia pisiidise</i> Klug
Orthoptera	
Acrididae	<i>Acridella</i> sp.
	<i>Poecilocerus bufonius</i> Klug
	<i>Sphigonotus carinatus</i> Sauss.
Gryllotalpidae	<i>Gryllotalpa africana</i> Beauv.
Tettigoniidae	<i>Phaneroptera cleomis</i> Ayal et al. (on <i>Cleome droserifolia</i>)

Table 3: The Arachnida recorded

Order: Scorpionida

Buthidae

<i>Leirus quinquestriatus</i>	El-Sebaiya, 30.7.1994; 1: Wadi Isla, 4-5.8.94
<i>Compsobuthus weneri</i>	Wadi Abu-Orma, 2.8.94 (2); Wadi Isla, 4-5.8.94; Wadi Isla, 6.8.94 (2); Wadi Hebran, 8.8.94
<i>Orthochirus innesi</i>	Wadi Mi'ar, 7.8.94 (1); Wadi Hebran, 8.8.94 (5)

Order: Araneida

Araneidae

Wadi Hebran, 8.8.94 (1sM, 2j)

Clubionidae

Cheiracanthium

Wadi Hebran, 8.8.94 (1M, 1j)

Hetropodidae

Wadi Hebran, 8.8.94 (1j); Wadi Rahaba, 31.7.94 (1j)

Gnaphosidae

Pterotricha

El-Sebaiya, 30.7.1994 (1F, 1sF); Wadi El Rahba, 31.7.94 (1sM); Wadi Isla, 4-5.8.94 (2F,1j); Sahl El-Qa'a, 6.8.94 (1F,1j); Wadi Hebran, 8.8.94 (4F,1sF, 1sM,2j)

Loxoscelidae

Loxosceles

Wadi Isla, 4-5.8.94 ((1sF); Wadi Hebran, 8.8.94 (1sF)

Lycosidae

Wadi El Tarfa, 1.8.94 ((1sF); Wadi Isla, 4-5.8.94 (1M,1F); Wadi Hebran, 8.8.94 (1M,2F,1sF)

Oxyopidae

Oxyopes

Wadi El Tarfa, 1.8.94 (1M); Wadi Hebran, 8.8.94 (1M)

Peucetia

Wadi El Tarfa, 1.8.94 (1F,2sF,6j); Wadi Hebran, 8.8.94 (3F,3sF,9j)

Philodromidae	
<i>Philodromus</i>	Wadi Isla, 6.8.94 (4F); Wadi Hebran, 8.8.94 (5F,1j)
Pholcidae	Wadi Hebran, 8.8.94 (1F)
Salticidae	Wadi El Tarfa, 1.8.94 (1M); Sahl El Qa'a, 6.8.94 (2M); Wadi Isla, 4-5.8.94 (1M,1j); Wadi Hebran, 8.8.94 (4M,3j)
Theridiidae	Wadi El Tarfa, 1.8.94 (1F); Wadi Isla, 6.8.94 (1F); Wadi Hebran, 8.8.94 (2F)
Thomisidae	
<i>Dzyptila</i> sp.	Sahl El No'amani, 31.7.94 (1sF); El Tarfa, 1.8.94 (1sF); Wadi Isla, 2.8.94 (2sF)
<i>Synema diana</i>	El Tarfa, 1.8.94 (1F); Wadi Isla, 2.8.94 (2M,1F)
<i>Thomisus bidentatus</i>	El Tarfa, 1.8.94 (1M,2F); Wadi Isla, 2.8.94 (11M,11F,2sF); Wadi Isla, 4-5.8.94 (2F,1sF)
<i>Thomisus onustus</i>	El Tarfa, 1.8.94 (1M); Wadi Isla, 2.8.94 (1M,4sM,1j,1f,1sF,4j); Sahl El Qa'a, 6.8.94 (1sF)
Order: Pseudoscorpionida	
Olpiidae	
<i>Olpium</i> sp.	Sahl El No'amani, 31.7.94 (1M,1F); Wadi Isla, 2.8.94 (1M); Wadi Isla, 4-5.8.94 (1F); Wadi Hebran, 8.8.94 (2M,2F)
Withiidae	
<i>Withius</i> sp.	Wadi Abu O'rma, 2.8.94 (2M,1F); Wadi Hebran, 8.8.94 (2M,1F)
Chernetidae	Wadi Isla, 2.8.94 (2j)
Order: Solpugida	
Daesiidae	Wadi Isla, 2.4-5.8.94 (2); Wadi Ma'ar, 7.8.94; Wadi Hebran, 3.8.94 (3)

In conclusion, we recorded 20 plant families with 51 species, including many Compositae; and eight insect orders, 54 families and 138 species, dominated by beetles, wasps and bees. There were four orders of Arachnida: Araneida with 12 families, 16 species and 91 specimens; Pseudoscorpionida with 3 families, 3 species and 8 specimens; Scorpionida with 1 family, 3 species and 11 specimens; and Solpugida with 1 family, 1 species and 3 specimens.

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الملخص العربي

الحصر البيولوجي لشبه جزيرة سيناء: الفلورا والفونا في وادي إسلا وحران - محمية سانت كاترين - مصر

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لأول مرة يتم عمل حصر مكثف على النباتات والحشرات المصاحبة لها بالإضافة إلى العناكب والعقارب المتواجدة بإثنين من أهم وأجمل الوديان بشبه جزيرة سيناء وهما وادي إسلا ووادي حيران. شملت الدراسة حصر التنوع البيولوجي داخل الوديين وتم تسجيل 20 فصيلة من التيات لتضم 51 نوعاً، 8 رتب من الحشرات، تضم 54 فصيلة و 138 نوعاً، 4 رتب من العنكبوتيات، تضم 17 فصيلة و 23 نوعاً كانت رتبة الخنافس ورتبة الزنابير والنحل والنمل هي أكثر الأنواع تمثيلاً داخل الوديين مقارنة بأعداد الأنواع من الرتب الأخرى.