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Contents

Cover Illustrations:

Front: A *Truxalis procera* Klug, photographed in the desert near Lihbab. Picture by Simon Aspinall

Back: *Acacia tortilis* and *Euphorbia larica* near Masafi. Picture by Simon Aspinall.

The Editorial Board of TRIBULUS and the Committee of the Emirates Natural History Group acknowledge, with thanks, the support of the Group's Corporate members, a full list of whom can be found on Page 2, and without whom publication would be impossible. We also acknowledge the support and encouragement of our Patron, H.E. Sheikh Nahayan bin Mubarak Al Nahayan, UAE Minister of Higher Education & Scientific Research.

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EDITORIAL

Although this issue of *Tribulus* is somewhat delayed, for which the editorial board offers its apologies, the delay does permit us to comment on the 2006-2007 winter weather, which has seen the best rainfall in the United Arab Emirates for a decade or so. Rains began in November 2006 with regular downpours still occurring four months later and, rather than being a widely-spaced collection of torrential downpours, these rains have been relatively frequent and often fairly steady, lasting for hours, thus permitting them to penetrate deep into the subsoil. They have, moreover, been widespread, with not only the Northern Emirates, including the Hajar Mountains, receiving rain, but also the desert areas to the west and south-west of Abu Dhabi, where rains are generally less frequent and less substantial. Offshore islands too have benefited, permitting the regeneration of vegetation after many years of drought.

Proper statistics on the 2006-2007 rains will, no doubt, be compiled and published in due course, but observers have commented happily on the diversity and profusion of the flora that emerged from a healthy seedbank after these rains, much more extensive than has been the case in recent years. Although less easy to record, the populations of our smaller fauna, too, will have benefited.

Besides the abundance of the flora, there have been other benefits from the rains, with fieldwork, often undertaken as part of environmental impact assessments for development projects, noting range extensions for a number of species that do not always appear during years of drought. One chance, but welcome, find was that of a species of annual grass new to the Emirates, reported in this issue by Gary Brown, Simon Aspinall and Drew Gardner, and whose nearest known location is several hundred kilometes away in Kuwait. The discovery of new species for the Emirates, whether of fauna or of flora, is always welcomed. However much fieldwork is undertaken, there are always new discoveries to be made.

Sadly, the area in which the new grass was discovered, the sand dunes fringing Umm al-Qaiwain's Khor al-Beida, is now scheduled, in part at least, for a major development project, one of several that are affecting the UAE's coastline, in particular. Although the Environment Agency - Abu Dhabi, EAD, continues to press for the designation of particular areas as nature reserves, and has recently recorded another success with the designation of a new marine reserve just to the west of the island of Abu Dhabi, there is still little sign that such a process is getting under way in any effective manner in much of the rest of the country. One result, inevitably, is that scientific data is being lost before it has ever been recorded and populations of certain groups put at risk, or worse.

The only consolation, if it truly is one, is that the various environmental impact assessments being carried out, to a greater or lesser degree, on the development projects do provide an opportunity to record information - even if major discoveries cannot always be guaranteed protection or effective mitigation measures to ensure their survival. Thus EIAs carried out in Sharjah and Umm al-Qaiwain have added very significantly to our knowledge of the Diptera (flies) of the Emirates, and we are delighted to carry an up-to-date checklist of the UAE's Diptera by Brigitte Howarth in this issue which includes information from those EIAs. Encouragingly, the Sharjah site, the Wasit Nature Reserve, is now formally protected - we only wish that some other areas of major importance to our flora and fauna could enjoy the same level of protection. It is, of course, inevitable that the current pace of development means that areas of environmental importance will disappear under bulldozers and concrete. We continue to wonder, though, why so little action is taken in much of the country to recognise, and to preserve, areas that, on the basis of detailed studies, both past and present, have long-been flagged up as being of major environmental importance, often internationally so. We wish the Ministry of Environment and Water and the various local environmental agencies good luck in their efforts, often highly frustrating - and frustrated - to preserve more of the country's biodiversity.

Besides the two papers already mentioned, this issue of *Tribulus* contains the usual eclectic mix of material, covering a wide range of the UAE's heritage and environment. Our lead paper, by Michele Ziolkowski and Abdullah Suhail al-Sharqi, offers a detailed historical and ethnographical study of one of the country's best-known ancient landmarks, the fortified house and compound in Wadi Hayl in Fujairah. We are pleased to note that the second author is a UAE citizen, and we look forward to receiving more submissions of papers by Emiratis in the future.

We should record, though, that although the authors, and others, have undertaken detailed studies of this important complex, the current programme of 'restoration' has signally failed to pay much attention to those studies and has, instead, involved the creation of architectural features which were not there in the original building.

Our final major paper is also on a natural history topic, with Gary Feulner and Richard Hornby offering a major review of the inter-tidal molluscs to be found on our coastlines. We hope that the paper will encourage others to embark on their own studies, for, as the authors would concede, their paper is not the final and definitive version of this aspect of the UAE's fauna - clearly much more remains to be discovered.

We shall continue to report on those discoveries as they occur and welcome any future submissions, no matter how large or small.

Corporate Members of the ENHG

Production of ***Tribulus***, and many of the other activities of the Emirates Natural History Group, including the grant programme of the Group's Conservation Fund, would not be possible without the generous support of the Group's Corporate Members, many of whom have provided consistent assistance over many years. The Editorial Board and the Group Committee acknowledge, with thanks, the invaluable support of the following companies and bodies, currently Corporate members of the Group, and all past Corporate sponsors:

Abu Dhabi Company for Onshore Oil Operation, ADCO; Al Fahim Group; Al Nasser Holdings; BP; Environment Agency - Abu Dhabi, EAD; Kanoo Group; Al Masaood; Intercontinental Hotels; Jashanmal National Company; METCO; Motivate Publishing; Nama Development; National Bank of Abu Dhabi; Omeir Travel Agency; Richards Butler Reed Smith; Rotana Beach Hotel; URS Dames and Moore.

Bayt Sheikh Abdullah bin Hamdan al-Sharqi, al-Hayl, Fujairah, U.A.E.

by Michele C. Ziolkowski & Abdullah Suhail al-Sharqi

Fig 1. Saif Rashid Al Kindi

This paper is dedicated to Mr Saif bin Rashid al-Kindi (Fig. 1). We admire his passion and his concern for this historical site. We also thank him for the copious amounts of ethnographic information he has provided over the years. He not only helped the authors with this study but he also provided much help for Ms Melissa Riley during her work at the site in the winter of 1997/98.

Introduction

The focus of this article is the large fortified courtyard house established by Sheikh Abdullah bin Hamdan al-Sharqi (*Fig. 2*) in the village of al-Hayl, Fujairah, United Arab Emirates. This study is primarily based on ethnographic information. Ethnographic data were recorded during numerous interviews with former inhabitants of the house, undertaken over the past two years. The information obtained from these interviews consists of historical, descriptive and anecdotal details.[1] The archaeological component of this study includes a brief examination of architectural features and construction details. The associated settlement does not form a major component of this study. However, it will be briefly reviewed in order to contextualise the main house.[2]

Location and Environment

GPS (Datum WGS 84):
N 25° 05.088'
E 56° 13.624'

The site is located in the emirate of Fujairah, on the East Coast of the United Arab Emirates (U.A.E.). The fortified courtyard house is located in the southern mountains of Fujairah at the village of al-Hayl. The terrain consists of mountains, ridges, terraces and *wadi* systems. *Zizyphus spina-christi* (Ar. *Sidr*), Acacia tortilis (Ar. *úamr*), *Euphorbia larica* (Ar. *'Usbuq*) and *Saccharum ravennae* (Ar. *'asal*) constitute part of the natural flora noted at the site,[3] which co-exists with cultivated gardens present throughout the wadi. Various plant species were and still are cultivated in these gardens, including the date palm (*Phoenix dactylifera*), henna (*Lawsonia inermis*), sorghum (*Sorghum vulgare* or *bicolor*), onion (*Allium cepa*), banana (*Musa* x *paradisiaca*), mango (*Mangifera indica*), papaya (*Carica papaya*), tomato (*Lycopersicon esculentum*), watermelon (*Citrullus lanatus*), pomegranate (*Punica granatum*), sweet potato (*Ipomea batatas*), guava (*Psidium guajava*), lime (*Citrus aurantifolia* var. *limetta* & *acidica*), cucumber (*Cucumis sativus*), carrot (*Daucus carota*). There were also naturally occurring plants, which provided food sources, including the jujube fruit (Ar. *Nabq*) from the Zizyphus tree, and salad herbs such as wild sorrel (*Rumex acetosa?*) (Ar. *Hàmàó*). The main cash crop grown by the people of al-Hayl was tobacco (*Nicotiana tabacum*).[4] This was sold to two buyers from Bahrain, Bin Hashem and Bin Yousef.

The fortified courtyard house of Sheikh Abdullah bin Hamdan is situated on a prominent rise overlooking the surrounding village and wadi *(Fig. 3)*. The house was built within the previously-established village of the Kunud tribe (*sing. al-Kindi*). Two tributar *'awdiah* (sing. *wadi*) provided access to various mountain villages. The Wadi al-'Amdia, situated southwest of the courtyard house, led to villages in the Wadi il-Hilu, while the Wadi al-Safiyah located to the west provided the route to Wadi Saham and Wadi Miduk. The journey through Wadi al-Hayl to the coastal town of Fujairah used to take around three hours by donkey.

Fig 2. Sheikh Abdullah bin Hamdan Al Sharqi.

Historical Reference

Lorimer's account of the village in Wadi al-Hayl is brief and lacks detail.

According to Lorimer: Thus, naming the village as 'Hail', his account says its position is "Inside the hills behind Fujairah", being "a village of around 10 houses of Jalajilah and Kunud."[5]

Fig 3. General view of the fortified courtyard house.

Ethnographic & Archaeological Information

According to local sources, the fortified courtyard house, mosque, majlis and watchtower were constructed around 1932 (*Fig 4*).[6] Bin Shimal, a local family living in Kalba and Fujairah, constructed houses in the area, including much of the house at al-Hayl (Ziolkowski & al-Sharqi 2005: 104; 2005a: 184). A second builder by the name of bin Shambi also worked on the main house and the watchtower on the hill. Prior to the construction of Sheikh Abdullah's house at al-Hayl, he resided in the large fortified courtyard house of his father, Sheikh Hamdan bin Suroor al-Sharqi, situated below Fujairah fort (Ziolkowski & al-Sharqi: *in press*).

The gabbro/dolerite rocks used in the construction of the courtyard house, mosque, majlis and watchtower at al-Hayl were all locally sourced. *Saruj* was used on buildings at the site as mortar and plaster.[7] *Saruj* plaster on the external walls was placed in layers, each layer ending with a small upward curvature. This was done so that any rain falling on the building would be diverted away from the foundations. A soft mud-based mortar was also used to bind the rocks throughout parts of the construction. This soft mud mortar is also found on various walls, as a layer of plaster below the *saruj* or the gypsum. A fine and smooth gypsum plaster was used on many of the interior walls in the courtyard house.[8] Mangrove (*Avicennia marina*) poles used in the construction were either traded from East Africa (Unwin 1988: 155), and/or locally sourced from the Khor Kalba area (Ziolkowski & al-Sharqi 2005a: 185).[9] Unidentified planks of hardwood were also used throughout the buildings. Date palm trunks, branches, stems and leaves were used extensively throughout all of the buildings in Wadi al-Hayl. Date palm tree fibre was also used to create ropes, which were used in the building construction. Lastly, cement was also added to the construction of certain buildings at the site. The *khaymah* type rooms located within the courtyard house were semi-subterranean in nature. The walls were built with mountain rocks bound with a soft mud mortar and rubble fill. They contained pitched roofs constructed with wooden poles, which were covered with date palm branches (*Fig 5*).[10]

Fig 4. Wadi Al-Hayl, ca 1970s

Fig 5. Wadi Al-Hayl, ca 1970s

Table 1: The Fortified Courtyard House, Mosque, and *Majlis* (*Fig 6*):

No.:	Feature:	Comment
1	Courtyard house	A fortified courtyard house with private living space for the family. The courtyard walls and the internal watchtower all contain firing slots for defensive purposes. These slots are arranged in a manner which would ensure maximum coverage and cross-fire. The internal watchtower also contains hooded firing slots.
2	Private family room 1	Private family room 1 was used by the family as a living space and bedroom.[11] This room originally contained a double wooden door in the entryway. A room built with *shrbaq* (a lattice of criss-crossed date palm stems bound with date palm fibre rope) was originally attached to the front of this room. The four *in situ* columns present at the site were used to support the walls and flat roof of this room. Wooden poles were also used within the structure. These were primarily used to support the roof, which contained bound date palm branches. This room provided the family with protection from the sun and added extra living space. The room also allowed the mountain breezes to flow through the structure and cool the interior space.
3	Courtyard watchtower	The ground floor of the courtyard watchtower was used as a storage room. It also contained a small raised platform at the base of the stairs for performing ablutions. This platform (*dkka*) contains three shallow, concave depressions within a raised step. Ceramic water vessels were originally set into these. These pots (*khars*) were constructed with a fine, buff coloured ceramic, and were biconical in shape.[12] A drainage hole is also located in the western wall. The first floor was primarily used as a private family living room. The top of the tower provided a commanding view of all access routes into the village. The northwest corner of the tower roof also contains a small lookout post. Attached to the front of the tower and entered from the *shrbaq* enclosure was a small washroom. This was constructed with tightly bound date palm branches and wooden poles (*'arish*).
4	Side entrance	This entrance, located along the western courtyard wall was mainly used by the women of the house. From here they would set out with their ceramic vessels (*yahlah*) to collect water from the wadi below.[13] From this entrance they would also tend to the livestock, which were housed in the large rock-built enclosure directly opposite the entrance exterior. This opening originally contained a double wooden door.
5	Kitchen	The kitchen is a *khaymah* type structure, which once contained a pitched roof. Originally the kitchen door was made of bound date palm stems. A sun-roof (*sablah*) was once attached to the front of this room. This was built with wooden poles and bound date palm branches. During the hot summer months most of the cooking would take place under the shade of the *sablah*.[14]
6	Private family room 2	This was a private living and bedroom space. The smaller unit located in the northern portion of the room was used as a washroom. This washroom also contained a *dkka* with three concave depressions for the ceramic *khars*. This room originally contained a double wooden door in the entryway. Attached to the exterior of 'private family room 2' was a *shrbaq* enclosure, which extended out to the two columns still present at the site.[15] This structure is comparable to the one located in front of 'private family room 1.' Located outside the *shrbaq* room was a raised sleeping platform *(siam)*. This measured around 2 metres in height and contained a ladder for access. Sleeping platforms were used during the hot summer months.

No.:	Feature:	Comment
7	Wall access	A group of stones set into the northern courtyard wall, which protrude from the surface, were used by the inhabitants of the house. From here, they would climb up the wall in order to pass food or other goods to the neighbours.
8	Private family room 3 & majlis	Initially this was the private room for Sheikh Abdullah's eldest son, Mubarak. After the death of his son, it was used as a *majlis*. This room originally contained a double wooden door in the entryway.
9	Main entrance	The original wooden door from the main entrance is now missing. It was originally a set of double wooden doors, with a smaller, arched doorway set into right hand door.[16] Located to the right of the main door is a long bench, which was built abutting the main courtyard walls. This bench was used as a gathering place for the people of the village to gather and discuss issues affecting the local inhabitants. Originally the bench was one level and contained an arm rest at either end. Centre front of the bench were two steps.[17] Situated atop the main entrance are four upright pillars. Constructed within these pillars was a summer sleeping room. The walls were originally built with *shrbaq* and then lined with woven date palm matting (*simah/ˌaùãr*). Two of the original wooden poles for the frame are visible in *Fig 7*.[18]
10	Private family room 4	This *khaymah* type room contained a pitched roof. Attached to the entrance of the *khaymah* was a double wooden door. Originally, the front of the *khaymah* contained an '*arish* type structure. The *'arish* was built with wooden poles and bound date palm branches, containing a flat roof. This provided the inhabitant of the room with added private living space.
11	Shop	The shop located in the south-eastern corner of the courtyard sold various items including rice, sugar, sorghum, coffee, clothes, perfumes, rose water, and jasmine oil.[19] The shop originally contained a double wooden door in the entryway. A *madbasa* (date processing area for the collection of *dibs* or date syrup) was placed at the western end of the room at a later date, after the departure of Sheikh Abdullah. The *madbasa* measures 2.85x1.10 metres, and contain rows of ridges and channels.[20] These ridges were built with small rocks, mud mortar and concrete. A circular-shaped depression used to collect the syrup is visible on the eastern side of the ridges.[21]
12	Rear entrance	Animal pens were located directly outside the rear entrance. These included rock-built enclosures with flat roofs made of date palm branches and wooden poles. This opening originally contained a double wooden door.
13	Storeroom	This room provided the main storage facility of the courtyard house.[22] The storeroom originally contained a double wooden door in the entryway. Dates were stored in large ceramic storage containers known as *khars*.[23] Kitchen utensils and cooking pots were also kept in here. Plus various foodstuffs including rice, flour, sugar and coffee.
14	Mosque	Located at the front of the courtyard house to the east is a mosque. The courtyard of the mosque is enclosed with a low rock-built wall. This area was once covered with a *sablah* type roof. The entrance to the mosque contained a double wooden door.
15	External *majlis*	This room was used as a reception room for entertaining guests. There is a small corner shelf located in the northeast corner of the room. The courtyard space in front of the room originally contained side walls and a flat roof, which were attached to the three exterior columns present at the site. This structure was primarily built with wooden poles and bound date palm branches. The cleared area to the front of the *majlis* in the north was also used for drying dates after the summer harvest.

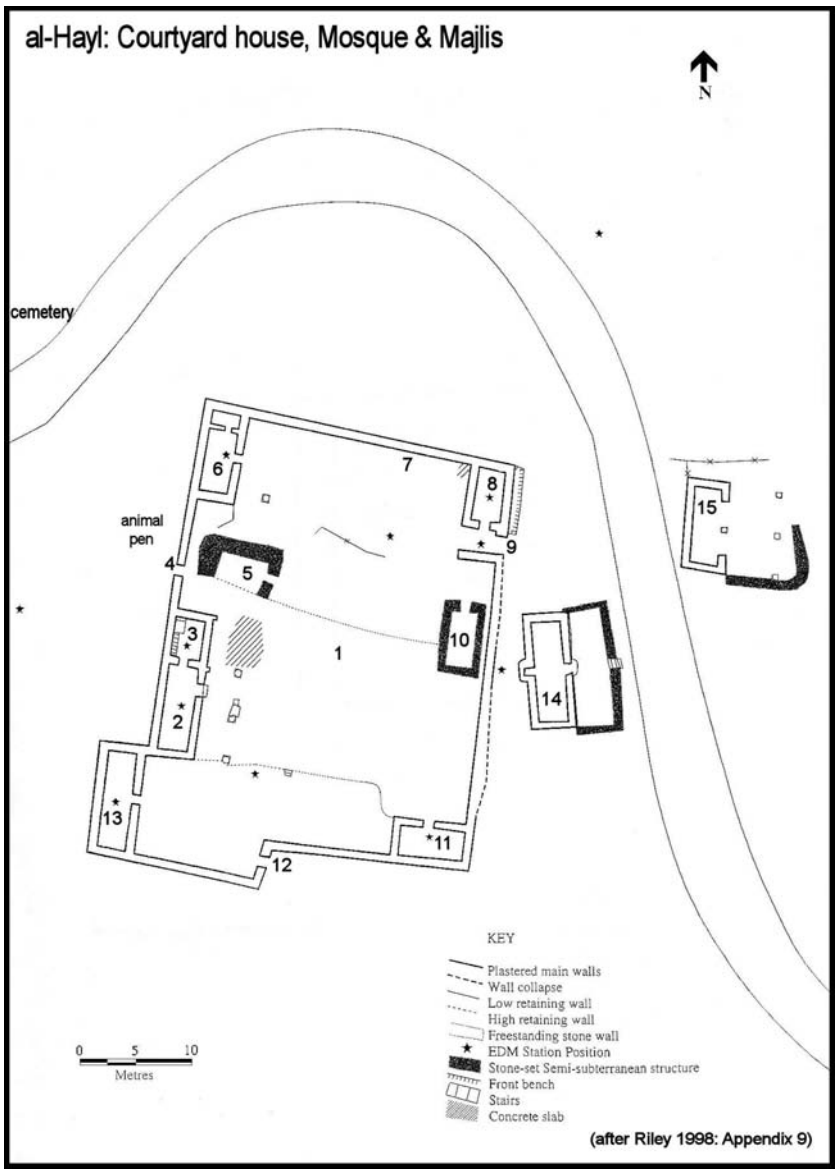

Fig 6. Plan of Courtyard house, Mosque & *Majlis* (after Riley 1998: Appendix 9).

Fig 7. Main entrance, ca 1970s

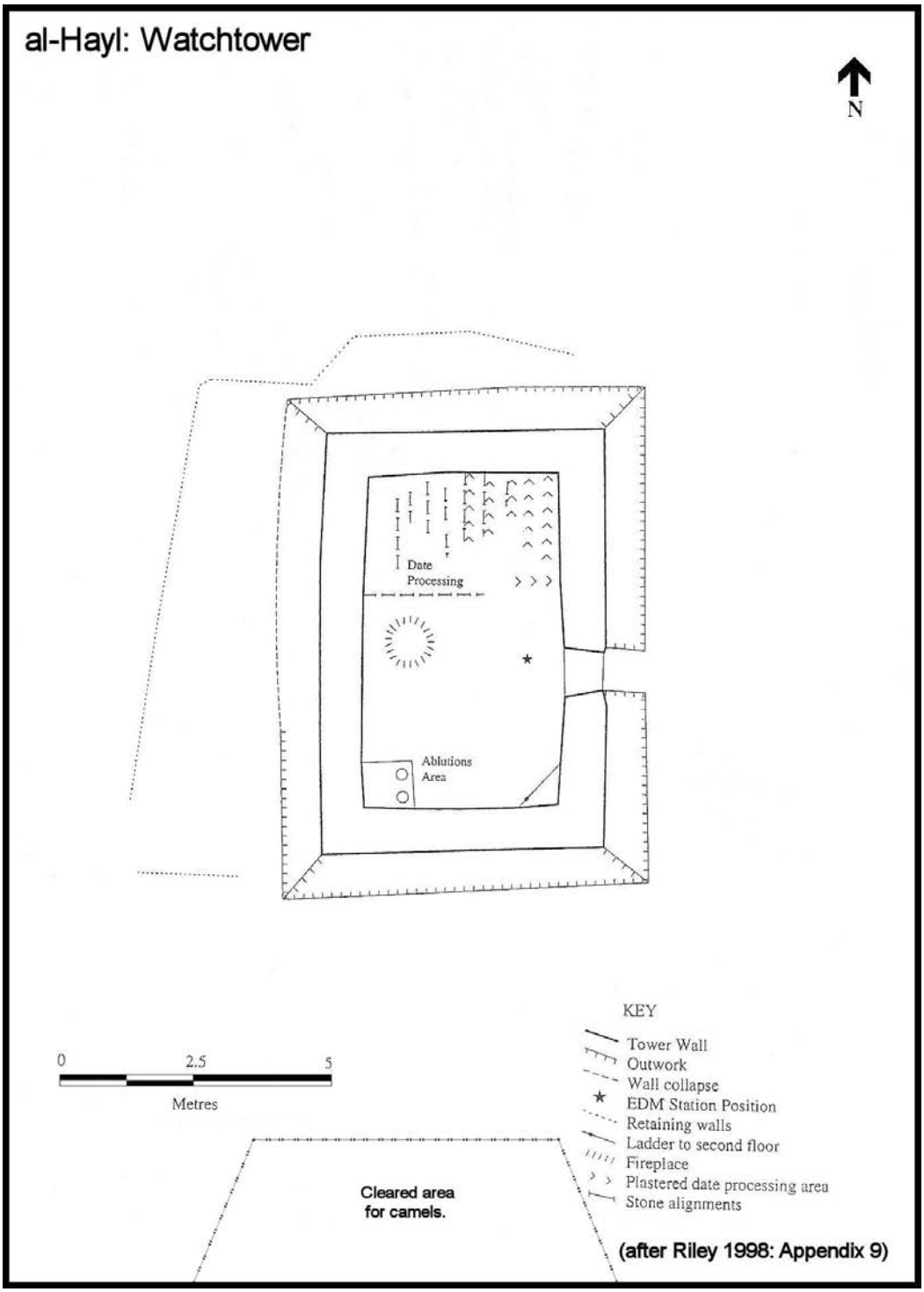

Fig 8. Plan for external watchtower (after Riley 1998: Appendix 9).

The External Watchtower (*Fig. 8*)

The watchtower is located on the hill behind the courtyard house, to the south southwest. It was originally built for Sheikh Abdullah's younger brother, Sheikh Suhail. Sheikh Suhail also resided in two *khaymah* type houses positioned directly below the watchtower (Ziolkowski & al-Sharqi 2005: 104; 2005a: 184). It is not clear as to how long the watchtower was used as a residence. Sheikh Suhail eventually moved to al-Fara' at the entrance to Wadi Furfar, and built his own fortified courtyard house, *ca* 1950 (Ziolkowski & al-Sharqi 2005: 104; 2005a: 184). The ground floor of the watchtower contains a *dkka* along the western wall. This washing area has two circular-shaped concave depressions for water vessels, and a drainage hole on the western wall. There is a ladder constructed with mangrove poles set into the walls in the south-eastern corner. The walls of the watchtower contain standard, angled firing slots and hooded examples. The upper (roof) level of the watchtower contains two corner lookouts located in the northeast and southwest corners. The *madbasa* present on the ground floor of the watchtower was constructed after Sheikh Suhail's departure to al-Fara'. The cleared and levelled area supported by a rock-built embankment located directly to the south of the watchtower was used to house camels during the night.

Table 2: The Associated Kunud Village

Feature	Description
Khaymah (*Fig 9*)	A semi-subterranean, rectangular/rectilinear shaped room, built with mountain rocks, bound with mud mortar and rubble, and containing a pitched roof. Roofing materials consisted of wooden poles for support and bound date palm branches. The entrance to a *khaymah* can either be located along a short or long wall. The *khaymah* building was used as either a home or an animal shelter. Various houses also contained courtyard walls.
Kerin *(Fig 10)*	An above-ground, rectangular shaped room, built with mountain rocks bound with mud mortar and rubble. The end walls extend up to the roof pitch and are pointed. A long wooden beam was placed between the two end walls. Smaller wooden poles completed the frame and bound date palm branches were used as roofing material. The door is located along a long wall. The *kerin* building was used as a home. Various houses also contained courtyard walls.
Makhzan *(Fig. 11)*	An above-ground, rectangular shaped room, built with mountain rocks, bound with a mud mortar and rubble. The exterior walls slope inwards slightly and the roof is flat. Roofing materials consisted of wooden beams, bound date palm branches and mud mortar with rubble. The entrance is located on a long wall. These buildings were either used as homes or storerooms. Often for the storage of dates and *dibs*.
Small circular room *(Fig.12)*	Above ground, circular shaped room, built with mountain rocks and rubble fill. A small entrance with stone lintels. The roofing was formed with various branches, which created a dome. This was then covered with *'usbuq*.[24] These were used as chicken pens.
Cow pen	These were the largest animal enclosures. The walls were built with mountain rocks, bound with a mud mortar and rubble. They are either square or rectangular in shape. A cow pen is located directly opposite the side entrance (*Fig. 6*: *see plan*) of the courtyard house.
Goat pen	These enclosures consisted of a *khaymah* type room with a large attached courtyard. The courtyard walls were built with wooden poles and date palm branches. The *khaymah* would often be used during the winter months, whilst the courtyard would serve as a summer enclosure.
Mu'arush (*Fig.13*)	Tobacco drying rooms. Three tobacco drying rooms are located in close proximity to the courtyard house. Originally three more tobacco drying rooms were located near the main house. A further two rooms are situated in the wadi below, close to the cultivated gardens.[25]
Yanoor *(Fig.14)*	Henna drying and sorghum threshing area. Two of the three threshing areas remain at al-Hayl. The *yanoor* was a cleared, levelled space, cut into the side of the mountain, with walls built up around all sides using locally collected rocks. The base of the *yanoor* contained a packed clay surface.[26] Henna leaves were dried on the *yanoor*, processed into a powder and mixed with water, in order to use as decoration.
Cemetery	The village cemetery is located north-west of the house (*Fig. 6*: *see plan*).

Fig 9. *Khaymah*

Fig 10. *Kerin*

Fig 11. *Makhzan*

Fig 12. Chicken pen.

Fig 13. *Mu'arush* (tobacco drying room walls).

Fig 14. *Yanoor*

Table 3: Features at the site, predating the courtyard house and associated Kunud village

Feature	Description
Grave and Umm an/al-Nar pottery sherds *(Fig.15)*	A pre-Islamic, circular-shaped grave (diam, ca 5m), with associated Umm an/al Nar period ceramic sherds (Ziolkowski *in press*).
2nd and 1st millennia pottery sherds	This pottery was recovered by the Swiss archaeological mission (Corboud *et al.* 1991: 14).
Soft stone lid	An Iron Age period soft stone lid was recovered from a wadi terrace in close proximity to a number of petroglyphs (Ziolkowski 1998: 17).
Rock art	A large corpus of rock art has been studied at the site over the years (Ziolkowski 1998; Ziolkowski *in press*).
Hillfort *(Figs 16 & 17)*	The hillfort was constructed with mountain rocks, mud mortar and rubble. It contains a large entrance, thick walls, a complex of interconnecting rooms and the base of a circular-shaped tower. The structure also consists of a large open space, which holds a small square cistern (?), plastered with saruj. Located on a lower slope to the north is a walled terraced area. Situated below the hillfort are numerous rock-built ring walls at varying levels. Charcoal samples excavated from the hillfort place it within the likely timeframe of cal. AD 1470-1705.[27]
Village on lower terrace	This settlement is located on a lower terrace and in the wadi to the south of and below the hillfort. An exact date is unclear. It is plausible that this settlement is contemporary in date with the hillfort.

Fig 15. Sherds from pre-Islamic grave.

Comparative Architecture

Architecturally, Bayt Abdullah bin Hamdan al-Sharqi is comparable to numerous fortified and non-fortified courtyard type houses located throughout the Arabian Peninsula and the Gulf. This particular topic has been examined in detail in previous papers by various authors.[28] We have chosen to highlight the fortified courtyard house of Essa bin Saed al-Thabahi, which is located within a comparable settlement context to al-Hayl.[29] Essa al-Thabahi's house was established around 1900 and is situated within the wadi system of Wadi il-Hilu, Sharjah Emirate, at N 24° 59.459', E 56° 13.018'.[30] This large, fortified, multi-courtyard house contains numerous rooms, wells and architectural features (*Fig. 18*). In the centre of the house was a large built-in tower, of which the stairs are still visible today. This house is also surrounded by four watchtowers, three of these are located on the nearby mountains, whilst the fourth is situated in the centre of the wadi on a raised natural terrace.[31] The associated settlement consists of a mosque (*Fig.19*), Islamic cemeteries, houses, animal enclosures, walls, agricultural plots and tobacco drying rooms.[32] A large portion of the associated village has been removed during the past two years for the development of agricultural fields. All the architectural structures at this site were built using comparable building materials and techniques to those incorporated at Wadi al-Hayl.[33]

Interestingly, the people from the village at Wadi al-Hayl would often travel to the gardens in Wadi il-Hilu during the tobacco season to gain employment. The cultivation of tobacco brought in considerable revenue for the residents. The tobacco from Wadi il-Hilu was sold to three businessmen, Bin Yousef, Bin Hashm (Bahrain) and Bin Hamza. The extensive gardens in Wadi il-Hilu and the large-scale tobacco cultivation that took place made it an extremely wealthy region.

Conclusion

As noted by Riley, the courtyard house at al-Hayl has often been incorrectly referred to as a "summer palace" (Riley 1998: 7-8). In fact, Sheikh Abdullah bin Hamdan lived in the house permanently for more than twenty years. He later established a house north of Mirbah on the Fujairah coast (ca. 1958). Finally he moved from Mirbah in the early 1960s and established a house at Dibba. According to Riley, most of the inhabitants of al-Hayl village were relocated to a new village by the government during the 1970s. The final inhabitants left as late as 1979 (Riley 1998: 7). Many of the farms at al-Hayl are still under cultivation.

The fortified courtyard house and settlement in Wadi al-Hayl is reflective of a traditional mountain village in this region. The accumulated ethnographic data has provided the authors with an insight into the social dynamic of such a society. Those interviewed for this study have often wistfully reflected on this not-too-distant past, with fond memories. Modern conveniences aside, these glorious mountain villages provided the inhabitants with a dynamic and social environment. *Insha'allah*, villages such as these will be spared from destruction, in order to preserve a part of Emirati history which is otherwise sadly being lost.

Fig 16. Hillfort entrance with courtyard house in the background.

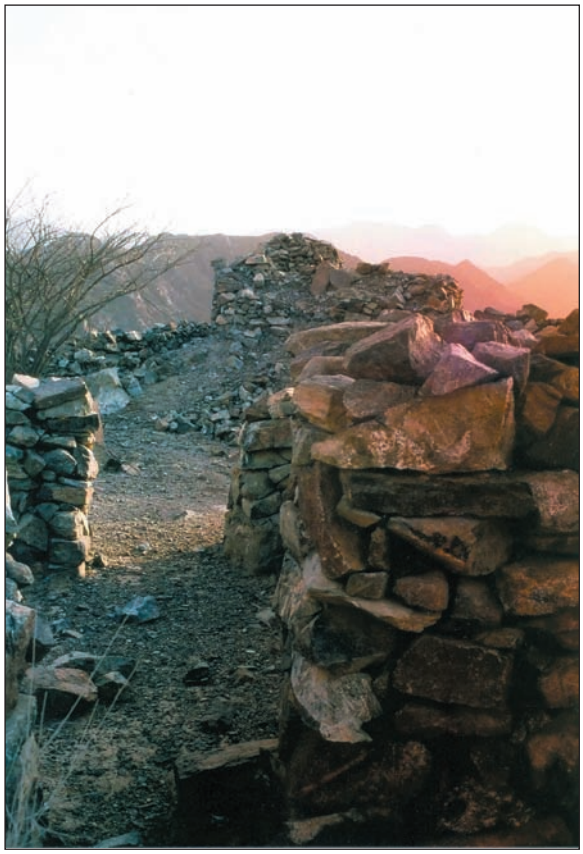

Fig 17. Hillfort circular tower.

Fig 18. General view of Wadi il-Hilu (main house, mosque, watchtower, fields).

Fig 19. Wadi il-Hilu mosque.

Acknowledgements

We would like to thank the following people for sharing their knowledge of the courtyard house and the village in Wadi al-Hayl: M. al-Kindi, F. al-Sharqi, F. al-Kindi, and Saif bin Rashid al-Kindi. Special thanks to the Department of Archaeology, Sharjah Emirate, for allowing us to mention various sites in the Wadi il-Hilu. Thank you to Saif al-Thabahi and Ali bin Saif al-Thabahi for providing their time and knowledge concerning the settlement in Wadi il-Hilu. We would also like to thank Val Russell for providing early photographs of the site at al-Hayl (Figs 4, 5 & 7). These photos are of great importance and relevance, considering the fact that the site is currently under restoration. We also thank Sheikh Suhail bin Abdullah al-Sharqi for providing a photo of his father, Sheikh Abdullah (Fig 2: photographer unknown). We must acknowledge the work of Ms Melissa Riley. Her honours thesis is, to this day, the only major study of the courtyard house at al-Hayl. Figs 6 and 8 are based on Riley's original plans. We hope that our ethnographic work will complement her study. All photographs are by the authors, unless otherwise stated.

Arabic words have been transliterated according to those commonly used. Diacritical marks have been removed due to complications with publishing them.

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[1] The archaeological component of this study is deliberately brief, due to the fact that the site and material culture has been comprehensively studied by M Riley (1998). For Riley's architectural analysis of the courtyard house at al-Hayl, see: Riley 1998: 48-77. Concerning the smallfinds and ceramics, Riley has studied this material in great detail: Riley 1998: 19-28 & Appendices 3 & 4. A copy of Riley's thesis is lodged with the Fujairah Museum.

[2] A certain amount of information has already been published previously by the authors: Ziolkowski & al-Sharqi 2003. However, this current paper is an updated and more precise account of the ethno-archaeology at al-Hayl.

[3] Plant identifications were made with the aid of the following reference source: Jongbloed 2003.

[4] Plant identifications were made with reference to: Potts 1994. For a detailed account of the introduction of tobacco into Southeastern Arabia, see: Potts 1994: 258-9.

[5] See: Lorimer 1995: 25. As noted by Riley, Lorimer does not mention the large courtyard house, majlis, mosque or watchtower, see: Riley 1998: 7. Lorimer's study took place during the early twentieth century and therefore his lack of reference to these features correlates with the timeframe purported in this paper. His reference to the "Jalajilah" tribe is curious. Those interviewed for this study could confirm only the presence of the Kunud tribe in the Wadi al-Hayl.

[6] The *majlis* and mosque were built around the same time as the courtyard house. The watchtower was built shortly afterwards.

[7] Regarding the manufacture of *saruj* see: George 1987: 221-2; Ziolkowski & al-Sharqi 2005a: 185.

[8] It is unclear whether or not the gypsum plaster was also mixed with small amounts of *saruj* or mud in some areas. Patches of gypsum plaster are also visible on some external walls, located below a layer of *saruj.*

[9] Roofing material throughout the courtyard house was often comprised of: mangrove wood poles, woven palm matting, soft mud mortar with a few mineral inclusions, rubble and finally an exterior layer of cement. U-shaped wooden drainage spouts were also used to remove excess water from the roofs to the exterior of the courtyard.

[10] The *khaymah* type houses throughout the village were all constructed in a similar manner.

[11] Wall niches located throughout the private family rooms were used for storing personal items, plus lanterns and porcelains bowls/plates. Wooden hanging pegs were also used for storing personal items.

[12] For further detail see Ziolkowski & al-Sharqi 2005a: 196 & Fig. 56.

[13] For further detail see Ziolkowski & al-Sharqi 2005a: 237 & Fig. 57.

[14] See also Ziolkowski & al-Sharqi 2005a: 187.

[15] Note: one of these columns is attached to the top of the courtyard wall.

[16] Unfortunately the new wooden door produced by the restoration team differs from the original.

[17] Unfortunately this bench has not been restored to its original form.

[18] Unfortunately fanciful decorative elements have been added above the entryway. This fanciful restoration work bears no resemblance to the original structure as noted at the site prior to restoration and as seen in old photographs.

[19] Located on the western side of the shop was a small kitchen area constructed with a *sablah* type roof.

[20] The processing of dates requires that the baskets of dates be piled up at the upper end of the madbasa, and their own weight gradually presses out the juice from the fruit, which then runs down the channels to a tank: Højlund 1990: 77. This "tank" was often a sunken ceramic vessel.

[21] There appears to be some type of plaster (?), which was used to coat the interior of this receptacle.

[22] The original interior walls of this room did not contain any niches. However, wall niches have been placed in this room by the restoration team working at the site.

[23] See also Ziolkowski & al-Sharqi 2005a: Fig. 54.

[24] For further details on this type of feature see: Ziolkowski & al-Sharqi 2005: 107; 2005a: 188.

[25] For a detailed description of the construction and use of the tobacco drying rooms see: Ziolkowski & al-Sharqi 2005: 112; 2005a: 211-12.

[26] This information has been extrapolated from: Ziolkowski M.C. & al-Sharqi A.S. (forthcoming).

[27] The small scale excavation which produced the charcoal sample was conducted during the winter of 1994/95 as part of the University of Sydney (Australia) expedition. For full details concerning the calibration of this date see: Ziolkowski MC 1998: 79. According to local sources, this hillfort was considered an historical site during the time Sheikh Abdullah resided at al-Hayl. The residents of al-Hayl would wander over the mountain and collect "old" pottery vessels as curiosities.

[28] An example of comparative compounds on the east coast of the U.A.E. is highlighted in: Ziolkowski & al-Sharqi 2005a: 238-9. Note: The non-fortified courtyard house of Khalfan bin Obaid al-Jalajilah at Miduk (Fujairah) should be added to this table of comparative compounds. For a more detailed discussion of comparative compounds, see: Riley 1998: 35-47. Riley compares the courtyard house at al-Hayl with examples from Bahrain, Kuwait, U.A.E. (Dubai, Ra's al-Khaimah, Fujairah), Sultanate of Oman (including the Omani enclave of Madha, north of Fujairah) and Saudi Arabia. Examples of 'tower houses' in Najran, southwestern Saudi Arabia have been recorded in: King G. 1998: 121-6 & 210. D. Kennet has comprehensively recorded and described the courtyard type houses in the emirate of Ra's al-Khaimah, see: Kennet *et al* 1993: 9-47; Kennet 1995. C. Velde has also published a detailed study of the fortified courtyard house of Falayah (Ra's al-Khaimah), see: Velde 2001: 5-9; Velde 2005: 89-101. For a discussion regarding the architecture of the courtyard type house and the above mentioned references, see: Ziolkowski & al-Sharqi 2005: 116-7; Ziolkowski & al-Sharqi 2005a: 245-50.

[29] As far as the authors are aware, this house has not been commented on or studied in relation to fortified courtyard type houses previously.

[30] The site is located within the mountains between Mleiha and Kalba. The main house, mosque, and four watchtowers were all established around the same time. The local name for the area where the main house is situated is al-Ghur'a.

[31] A further series of watchtowers and lookouts are located throughout the surrounding area. Many of these can be seen from the relatively new road through Wadi il-Hilu. It is however, unclear whether or not these are contemporary with the fortified courtyard house.

[32] Also noted at close proximity to the large multi-courtyard house are two copper slag scatters, hammerstones and one copper ore extraction zone. A pre-Islamic burial cairn is located beside the large watchtower in the wadi. Three petroglyphs have been noted by the authors within close proximity to the courtyard house. Petroglyphs located at another site in Wadi il-Hilu were noted by a French Survey team in 1984. The same team also noted numerous Islamic period settlements and a slag scatter see: Boucharlat et al 1997: 12.

[33] This includes the extensive use of *saruj* on the main buildings at the site. The site is currently undergoing restoration work. Unfortunately, the original *saruj* plaster on the buildings is being removed and replaced with a white, lime-based plaster.

Intertidal Molluscs in UAE Lagoons

by Gary R. Feulner & Richard J. Hornby

Abstract

This paper reviews the gastropod and bivalve mollusc species found in the intertidal lagoon environments of the UAE, including several Haminoeid and Assimineid gastropods not yet identified, and briefly describes their customary habitats. The species discussed are listed immediately below, totaling 25 gastropods and some 24+ bivalves. Species nomenclature is that of Bosch et al. (1995), except as otherwise indicated; family nomenclature follows the checklist of marine invertebrates in Hellyer & Aspinall (2005), compiled in conjunction with George (2005). Numbers in parentheses indicate those assigned to each species in Bosch et al. (1995), the most comprehensive mollusc reference for the UAE.

Class Gastropoda
Subclass Prosobranchia
Family Trochidae
- *Osilinus kotschyi* (#47)

Family Littorinidae
- *Littoraria (Littorinopsis) intermedia* (#114)
- *Echinolittorina arabica* (#115)
- *Peasiella mauritiana* (#119)

Family Planaxidae
- *Planaxis sulcatus* (#148)

Family Cerithiidae
- *Clypeomorus bifasciatus persicus* (#166)

Family Potamididae
- *Cerithidea cingulata* (#184
- *Potamides conicus* (#185)
- *Terebralia palustris* (#187)

Family Muricidae
- *Thais savignyi* (#493)

Family Columbellidae
- *Mitrella blanda* (#536)

Family Nassariidae
- *Nassarius (Plicarcularia) persicus* (#560)

Family Olividae
- *Ancilla (Sparella) farsiana* (#604)

Family Bullidae
- *Bulla ampulla* (#823)

Family Haminoeidae
- *Haminoea* sp. 1
- *Haminoea*(?) sp. 2

Family Assimineidae
- *Assiminea* sp.
- *Paludinella*(?) sp.

Subclass Pulmonata
Family Ellobiidae
- *Allochroa bronnii* (#849)
- *Cassidula* cf. *labrella* (#850)
- *Cassidula nucleus* (#851)
- *Melampus* cf. *castaneus* (#853)
- *Laemodonta monilifera* (#854)

Family Amphibolidae
- *Salinator fragilis* (#864)

Family Onchidiidae
- *Onchidium peronii*

Class Bivalvia
Family Mytilidae
- *Brachiodontes variabilis* (#943)
- *Musculista senhousia* (#954)

Family Pteriidae
- *Pinctada radiata* (#971)

Family Malleidae
- *Parviperna nucleus* (#979)

Family Ostreidae
- *Saccostrea cuccullata* (#996)

Family Spondylidae
- *Spondylus marisrubri* (#1014)

Family Lucinidae
- *Pillucina fischeriana* (#1026)
- *Anodontia edentula* (#1028)

Family Ungulinidae
- *Diplodonta* spp. (#1036-1039)

Family Chamidae
- *Chama reflexa* (#1066)

Family Mesodesmatidae
- *Caecella qeratensis* (#1106)

Family Tellinidae
- *Tellina* spp. (#1116-1123)
- *Pinguitellina pinguis* (#1143)

Family Psammobiidae
- *Asaphis violascens* (#1160)
- *Hiatula mirbahensis* (#1166)
- *Hiatula ruppelliana* (#1167)
- *Psammosphaerica psammosphaerita* (#1168)

Family Veneridae
- *Circenita callipyga* (#1198)
- *Amiantis umbonella* (#1205)
- *Callista florida* (#1207)
- Dosinia spp. (#1218-1223)
- *Marcia flammea* (#1225)

Family Laternulidae
- *Laternula erythraensis* (#1267)
- *Laternula navicula*

Introduction

The intertidal zone is a demanding environment under any circumstances, and it is especially demanding in the Arabian Gulf, where for much of the year high air temperatures and high water temperatures can make life very stressful whether the tide is in or out. Continuing investigation of intertidal molluscs in the coastal lagoons of the UAE, both along the Arabian Gulf and the Gulf of Oman, has given a better understanding of what species are present, where, and, to some extent, how they cope with the heat and threat of desiccation. These lagoons are generally characterised by low wave energy, high temperatures and hypersalinity. The intertidal parts of the lagoons support fewer mollusc species than most subtidal environments but, nevertheless, a wide range of species is present, including some that are abundant and others that are among the UAE's least conspicuous.

The main focus of this paper is the gastropods, because they are relatively easy for the casual observer to find, and new information is becoming available on this group. The most numerous molluscs in lagoons are probably bivalves but they are mostly rather small and live within rather than on the sediment. Some information is provided here on bivalves, but no attempt is made to cover the other classes of intertidal molluscs, i.e. the Scaphopoda (tusk shells), Polyplacophora (chitons) and Cephalopoda (cuttlefish which lay their eggs in intertidal parts of lagoons).

Mudflats

The most conspicuous molluscs of the intertidal lagoon environment are the Potamidids (mud creepers or horn shells). The two small, conical mud creepers of the Arabian Gulf, *Cerithidea cingulata* (#184 in *Seashells of Eastern Arabia* by Bosch *et al*.) and *Potamides conicus* (#185), exemplify the "grin and bear it" strategy. They lay out on mudflats in large numbers, typically fully exposed to the sun at low tide *(Fig. 1*). *C. cingulata* is most often found on areas of relatively firm and sandy substrate, but at some sites it may be almost totally overgrown by algae (*Fig. 2*). *P. conicus* is typically found a little higher than *C. cingulata*. It favours soft mud that seems to hold moisture, but may sometimes climb mangrove pneumatophores or take shelter under loose flaps of the black mats of cyanobacteria (formerly called blue-green algae) found in the uppermost intertidal zone. The two are similar in appearance and, especially when muddy, it may be difficult to distinguish smaller *C. cingulata* from adult *P. conicus*. Also found alive at a few sites in the Northern Emirates, on damp, soft mud in the uppermost intertidal zone, in association with *P. conicus*, is the air-breathing snail *Salinator fragilis* (#864). This species is far more commonly observed, however, as empty shells in flotsam at the high tide line and under saltbushes in Arabian Gulf khors.

Exposed Rock

On hard surfaces such as rock or beachrock (*fasht*), in areas without significant wave action, the small, nobbled winkle *Echinolittorina arabica* (#115) (formerly *Nodilittorina arabica*; Williams *et al*. 2003) is found in large numbers in the uppermost intertidal zone. This species is able to feed on micro-algae that live within the outermost layers of the rock, and over time it can excavate small hollows that serve to protect and conceal it somewhat, as well as to create a more favorable micro-environment (H. Brückner, *pers. comm*.) (*Fig.* 3). Despite the high temperatures at the rock surface, these 6-12mm shells can be present in such abundance that it is impossible to walk without stepping on them (*Fig. 4*). *E. arabica* is also common on silt and cyanobacterial mats in the upper part of the intertidal zone in the extensive lagoons to the west of Abu Dhabi island, and likewise in the East Coast salt marshes near Qurayyah, north of Fujairah (Morris & Morris 1993), but otherwise in the Northern Emirates it has been found in such environments only very exceptionally.

Sometimes found in association with *E. arabica* is *Planaxis sulcatus* (#148). *P. sulcatus* is more common as an intertidal mollusc in rocky environments with higher wave energy, but in both sheltered and exposed environments it demonstrates an alternative summer survival strategy: "stay cool in the pool". Whereas during the winter it is often abundant on emergent rocks at low tide, in summer it routinely beats the heat by staying submerged, i.e. by effectively *not* being intertidal. Even in summer, however, *P. sulcatus* can be found emergent in shaded hollows in beachrock. The suspicion has been expressed that "*Planaxis sulcatus*", which is widespread in the Indo-Pacific region, may prove to comprise two or more species yet to be differentiated (D.G. Reid, *pers. comm*.)

Saltbushes

Another summer survival strategy is to seek shade. There are a number of ways to do this; one is to find a "shade tree." Within the Arabian Gulf, the air-breathing Ellobiid species *Melampus* cf. *castaneus* (#853) has been found on damp ground under saltbushes (*Halocnemum strobilaceum* and *Arthrocnemum macrostachyum*) and rushes (*Juncus rigidus*) at the uppermost edge of the intertidal zone at sites from Ajman to Ra's al-Khaimah, and on mud under mangrove trees (*Avicennia marina*) at sites in Abu Dhabi from Ra's Ghanadah in the east to Dabb'iyah in the west. Also found under saltbushes at Khor al-Beidha, Umm al-Qaiwain, was the related air-breather *Laemodonta monilifera* (#854).

Under some of the same Arabian Gulf saltbushes, populations have recently been recognised of two tiny species not included in *Seashells of Eastern Arabia*. These are *Assiminea* sp. (c.3mm) and *Paludinella*(?) sp. (c.1mm), both Assimineids. The former is also found on the East Coast at Khor Kalba, in a somewhat different environment (see below). The two species occupy firm but damp ground under the saltbushes (*Fig 5*); the smaller *Paludinella*(?) is especially common in shallow depressions where mangrove leaves and other litter have collected. Both actively flee towards shade when they are exposed to sunlight by a prying observer. News of these Assimineids attracted the interest of a Japanese expert, to whom specimens have been sent for taxonomic study. *Assiminea nitida* has been said to live in estuarine habitats along Indo-Pacific shores and the subspecies *A.n. nitida* has been collected from brackish or possibly even freshwater plantation localities in the Eastern Province of Saudi Arabia (Neubert 1998). The UAE lagoon populations could represent the same species as in the Eastern Province, but even if so, it is now anticipated that they will prove to be distinct from better known Indo-Pacific relatives (D.G. Reid, *pers. comm*.).

Rarely, the winkle *E. arabica* (discussed above) and its cousin the mangrove tree snail *Littoraria* (*Littorinopsis*) *intermedia* (#114, discussed below) are found alive under saltbushes, and some that have been found in this environment manage to reach relatively large size. Moreover, in this environment the delicate nodularity of the shell of *E. arabica* is usually better preserved than on specimens from more typical habitats.

Fig 1. The mud creeper *Cerithidea cingulata* is often present in very large numbers on intertidal flats.

Fig 2. The mud creeper *Cerithidea cingulata* may be almost totally overgrown by algae.

Fig 3. Beachrock pockmarked by *Echinolittorina arabica* feeding on endolitihic algae.

Fig 4. Abundant *Echinolittorina arabica* on a beachrock platform near Rafa'ah, Umm al-Qaiwain.

Fig 5. Two gastropod species new to the UAE (*Assiminea* sp. and *Paludinella* sp.) have been recognised under these saltbushes fringing the intertidal mudflats at Khor al-Zawra.

Rock Crevices

L. monilifera and another air-breather, *Allochroa bronnii* (#849), are also found in hollows and overhangs of low beachrock cliffs. These and other local representatives of the Family Ellobiidae are not well studied taxonomically and the species names currently assigned to them may be subject to change (E. Neubert, *pers. comm.*). The authors have noticed that *Melampus* cf. *castaneus*, in particular, seems quite variable in form, and always somewhat different from the depiction in *Seashells of Eastern Arabia*.

Cliff Dwellers

Other species found in hollows and crevices on beachrock cliffs include the tiny winkle *Peasiella mauritiana* (#119) (*P. isseli* of the Red Sea has been distinguished by Reid & Mak (1998) and East Arabian specimens have been classified with the Indian Ocean *P. mauritiana*) as well as two diminutive bivalves - the mussel *Brachiodontes variabilis* (#943) and the winged oyster *Parviperna nucleus* (#979). These two species can be abundant, packing together very tightly, even to the extent of covering the rock beneath. The large rugose oyster *Saccostrea cucullata* (#996) can be conspicuous on more well-lithified cliffs along shorelines or channels, although because of its size the cliff environment does not provide the same degree of shelter to this species as it does to smaller ones *(Fig 6)*. *S. cucullata* is also sometimes found on the base of larger mangrove trunks within Khor Kalba (*Fig. 7*).

Still another intertidal cliff dweller found on UAE shores generally is the sea slug *Onchidium peronii* (*Fig. 8*), but this species can also be found on sandy and muddy substrates and has been found on mud within mangroves at various sites within Abu Dhabi Emirate and at Khor Kalba on the East Coast. Finally, the predatory *Thais savignyi* (#493) is found occasionally on cliffs within lagoons, e.g. at Khor Hulaylah. All of the cliff-dwelling species discussed here are able to tolerate sites exposed to at least moderate wave action (e.g. the lee sides of some breakwaters) as well as sheltered ones, and all are widespread regionally.

Algae and Sea Grass

The cerith *Clypeomorus bifasciatus persicus* (#166) occupies a niche all its own. It is typically found concentrated on mats of filamentous algae such as *Chaetomorpha linum* on intertidal mud flats and in channels, on seagrass flotsam at the high water line and in floating filamentous algal mats in lagoons. Perhaps this could be called the "damp cloth" strategy. However, *C.b. persicus* can also be common on seagrass in the subtidal zone down to about four metres. In addition, it frequently climbs pneumatophores within peri-mangrove areas - a "catch the breeze" strategy.

The buoyant shell of *Bulla ampulla* (#823) will be familiar to anyone who has walked the shoreline of any Arabian Gulf lagoon, but the live animal is less often seen. It inhabits lower intertidal areas of seagrass and algae, where it emerges from the surrounding sand at dusk. Breeding is synchronised and the adults die afterwards (D.G. Reid, *pers. comm.*), resulting in locally plentiful dead specimens. In the UAE, live animals have been observed at Khor Julfar, where apparent breeding occurred in March, but it is not known whether this is a regular annual phenomenon. DNA studies are expected to distinguish the populations of the northern Indian Ocean, including the Arabian Gulf, from the more southerly populations of East Africa (D.G. Reid, *pers. comm.*).

A similar appearing but smaller species (c.15mm), tentatively identified as *Haminoea* sp. (D.G. Reid, *pers. comm.*), darkly speckled through its transparent shell, has been found emergent on sea grass, at least in springtime, in Ra's al-Khaimah Khor and Khor Julfar. (*Fig. 9*)

Algal mats could also be home to other minute mollusc species that remain to be noticed and collected, much less identified, including possibly species that are not strictly intertidal, but rather brackish water and marine species that live preferentially on the algal substrate.

Fig 6. The rugose oyster *Saccostrea cucullata* on a cliff within Khor Kalba.

Fig 7. The rugose oyster *Saccostrea cucullata* on the base of an old mangrove tree within Khor Kalba.

Fig 8. The intertidal sea slug *Onchidium peronii.*

Channel Bottoms

The top shell *Osilinus kotschyi* (#47) is an upper sub-tidal to mid-intertidal species. In the lagoon environment it is typically found in shallow tidal channels, on relatively firm, well-washed sandy or shelly substrate, and occasionally with the cerith *Clypeomorus bifasciatus persicus* on algae or sea grass. It can also be found in rocky or stony foreshore environments exposed to moderate wave action. *O. kotschyi* is distinctive in that it typically covers its aperture not by closing its operculum, but by attaching itself to a broken piece of bivalve shell or a bundle of sand, shell and algae.

Three species that are readily found on clean sand within intertidal lagoons are *Nassarius* (*Plicarcularia*) *persicus* (#560), *Ancilla* (*Sparella*) *farsiana* (#604) and the small but attractive mitre shell *Mitrella blanda* (#536). These all have a large muscular foot with which they can readily drag themselves beneath the surface when it gets too hot (an "undercover" strategy), or when danger threatens. They probably spend time on the surface because that is where they find the highest concentration of their food (microscopic algae, other organisms and organic detritus).

Mangrove Forests

By comparison with many intertidal habitats, investigation of the UAE's mangrove forests, or mangals, requires some perseverance. The mangrove trees (*Avicennia marina*) may grow in dense thickets near channels, with variably saturated, anoxic and sulphurous mud and pneumatophores underfoot, sometimes with biting midges, and inundated twice a day, flooding major access channels to two metres or more.

Generally speaking, the UAE's Arabian Gulf mangals support all of the mollusc species discussed above, in the respective habitats. The East Coast mangroves at Khor Kalba, on the other hand, are somewhat distinctive and deserve special mention. The two small mud creepers, *P. conicus* and *C. cingulata* are found in large numbers in their accustomed environments at Khor Kalba, being intertidal mudflats and channels adjacent to the forest areas. But at Khor Kalba the large mud creeper *Terebralia palustris* (#187) is also present and locally abundant, mostly within the forest areas, on damp, organic rich mud under the mangroves and in the channels among them. This is the only natural site in the UAE where *T. palustris* is known to occur today.

Also found at Khor Kalba on mud within the mangrove forest are three smaller species: two air-breathing Ellobiids, *Cassidula cf. labrella* (#850) and *Laemodonta monilifera*, as well as *Assiminea sp.* (apparently the same as the Arabian Gulf species), although the mangrove mud environment seems quite different from the habitats in which the latter two species have so far been found within Arabian Gulf lagoons. Fowler (2005) has also recorded shells of the Ellobiid *Allochroa bronnii* (#849) from Khor Kalba.

The observed distribution of air-breathing intertidal gastropods within the UAE deserves brief comment. Only *Cassidula cf. labrella* has not been found within the Arabian Gulf, whereas *Melampus cf. castaneus* and the non-Ellobiid *Salinator fragilis*, both common along the Arabian Gulf coast, are unrecorded at Khor Kalba. Also absent at Khor Kalba is *Cassidula nucleus* (#851), so far known only from shells reported by Bosch *et al*. (1995) from lagoons along the Arabian Gulf coast of the UAE and collected by one of the authors (GRF) at Khor Hulaylah. As to these latter species, if they are in fact absent at Khor Kalba, this must be due to the lack of suitable local habitat rather than to any broader biogeographical parameters, since Bosch *et al.* (1995) record of *M. cf. castaneus* from the Gulf of Oman and *S. fragilis* and *C. nucleus* from Masirah Island, off southern Oman. Lists made by several UAE-based seashell collectors active during the 1980s and 1990s have been consulted and found to include no Ellobiids other than *M. cf. castaneus*.

Adding a dash of colour to the muddy substrate within the mangroves both at Khor Kalba and in Ra's al-Khaimah Khor (on the Arabian Gulf) is the small (c.7mm), vivid orange *Haminoea sp. (Fig. 10)*, not yet satisfactorily identified but currently under study at The Natural History Museum in London.

In the mangrove trees themselves, and preferentially in smaller trees on the edge of the forest, the mangrove tree snail *Littoraria (Littorinopsis) intermedia* (#114), a 1.0-2.5mm winkle, is found above the barnacle horizon, typically within the first 30-50cm above high water level *(Fig. 10)*. (Occasionally, tree snails may be noticed on the mud below mangrove shrubs, but this is normally because they have been inadvertently dislodged by the observer.) Rarely, the similar-looking winkles *Planaxis sulcatus* (#148, discussed above) and *Echinolittorina arabica* (#115, discussed above), normally found on rocky substrates, are found at the base of mangrove trunks or on pneumatophores. In this environment they are usually very small, dirty and worn looking.

Burrowing Bivalves

Many, if not most, bivalve molluscs are burrowers as a way of life and they appear to remain permanently within the sediment. This "undercover" strategy provides them with protection from predators, heat and desiccation, but also a micro-environment full of organic matter, on which they can peacefully filter feed. The most abundant bivalves in UAE khors are small, typically 5-8mm in diameter, and there can be thousands per square metre. The most abundant species are the Lucinid *Pillucina fischeriana* (#1026) and Venus clams of the genus *Dosinia* (#1218 to 1223). They live within the upper few centimetres of the intertidal mud and among the roots of seagrass in the low intertidal and shallow subtidal. Their discarded shells are essentially ubiquitous among shell debris within UAE lagoons. Other common small bivalves in low intertidal parts of Arabian Gulf lagoons are the striped mussel *Musculista senhousia* (#954), apparently restricted to the Arabian Gulf; the tellins *Pinguitellina pinguis* (#1143) and *Tellina spp.* (#1116 to 1123); the Venus clam *Callista florida* (#1207); and the distinctive lantern shell *Laternula erythraensis* (#1267), first described in *Tribulus* (Morris & Morris 1993). Individuals of the genus Tellina are very common around Abu Dhabi but seldom match up to the descriptions of the various species in Bosch *et al.* (1995), probably reflecting the influence of local conditions.

Larger bivalves are also present within intertidal flats. One of the most conspicuous is the edible Venus clam *Marcia flammea* (#1225), which can be seen exposed to the sun on wet mud in mid-summer - a peculiar strategy which results in it being much collected for food. Other large bivalves present in mudflats are the Venus clam *Amiantis umbonella* (#1205) and the bulbous Lucinid *Anodontia edentula* (#1028), whose shells can be abundant among shell debris in shallow tidal channels within lagoons.

On the East Coast, in mangrove channels at Khor Kalba, Morris & Morris (1993) reported a sequence of burrowing bivalves ranging from *Diplodonta* spp. (#1036 to 1039), *Laternula* spp. (#1267 *et al*.), *Marcia* spp. (#1224-1226) and *Hiatula* spp. (#1166 to 1167) exposed in subsidiary channels in the upper intertidal, to *Psammosphaerica psammosphaerita* (#1168) beside the main mangrove channel, to *Circenita callipyga* (#1198) and then *Asaphis*

Fig 9. A unidentified, speckled *Haminoea* (?) sp. at low tide in Ra's al-Khaimah Khor.

Fig 10. The tiny orange *Haminoea* sp. adds colour to the mangrove mud.

violascens (#1160) in the lower intertidal.

In sand flats at Qurayyah, north of Fujairah, they found *Caecella qeratensis* (#1106) and *Laternula erythraensis* (#1267) as recently dead, paired shells, along with *Hiatula* spp. and *Dosinia* spp. *Caecella qeratensis* and *Hiatula mirbahensis* were first scientifically described from this Fujairah locality and are named, respectively, for the nearby Fujairah villages of Qerat (Girath) and Mirbah (Morris & Morris 1993).

Encrusting Bivalves

Where hard substrate is present, another range of bivalve species is likely to occur, as many non-burrowing bivalves need to attach themselves firmly to a solid surface. The most suitable situations within lagoons are the sides and bottoms of natural drainage channels. Here, among others, one can expect to find the jewel box *Chama reflexa* (#1066), the thorny oyster *Spondylus marisrubri* (#1014) and the pearl oyster *Pinctada radiata* (#971).

Conservation

Sadly, as well adapted as they are, the outlook for many of the mollusc species discussed in this report is not very promising. Virtually all of the lagoonal environments in the Northern Emirates are under severe threat from development. Because there are generally no pre-existing claims on intertidal land, it has become a prime target for 'reclamation' and exploitation. Several well-known scenic khors and lagoons that have so far been untouched are even now being readied for at least partial destruction, too often to make way for projects that will be marketed under the ironic and ignominious pretext that, because they are close to water, they are close to nature and 'eco-friendly'.

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Diptera of the UAE - collated records from the literature with additions of new records, accompanied by some notes on Mydidae and Stratiomyidae new to the UAE

by Brigitte Howarth

Fig 1. A Mydidae visits the light-trap at Umm al-Qaiwain on 14th September 2006. Picture: Drew Gardner

Diptera are the two-winged flies, the name originating from the Greek words *dis*, meaning two, and pteron, meaning wing. Flies are the second largest group of insects with approximately 125,000 species described worldwide. This account is the most complete to date for UAE Diptera and includes 28 families, of which 7 are new records to the UAE. The total Diptera species count for the country is at least 135, of which 18 are new additions (marked [(n)] but see below table for further clarification), some of which still need further identification to genus or species level. This article uses the author's species list originally compiled for *The Emirates - A Natural History* (Howarth, 2005), which was unfortunately omitted from the publication.

The publishers of *The Emirates - A Natural History*, Trident Press, are kindly thanked for their permission to publish this updated checklist here. It will also be published, in English, in the forthcoming Arabic edition of *The Emirates - A Natural History*, now in press.

The version of the checklist below includes updates, omissions from the literature not listed in the original compilation, and new records. It is by no means exhaustive: many more species are known to be present, but these await identification. Some of the new records were kindly identified by Nigel Wyatt, curator of Diptera, Natural History Museum (NHM), London, (marked **) during a summer visit to the Museum in August 2004, in exchange for specimens (marked ***) donated to the Museum collections. Specimens held by the author are also identified (*). The remaining records have been gathered from the literature (some of which are also marked * as representatives are in the collections residing with the author).

To give a brief overview of the flies, their classification has traditionally divided them into three suborders, the Nematocera (e.g. mosquitoes, sand-flies, midges and gnats), the Brachycera (e.g. bee-flies, horse-flies, robber-flies), and the Cyclorrhapha (e.g. house-flies, fruit-flies, hover-flies and blow-flies).

However, recent phylogenetic work places all Diptera into two suborders, the Nematocera and Brachycera, the Cyclorrhapha now being part of the Brachycera. Both suborders are well represented in the UAE. The Nematocera include both flies of medical importance as well as many that are not involved with diseases. Phlebotomine sandflies (Psychodidae) are of medical importance, some species of which transmit viruses, while others transmit dermal and visceral leishmaniasis (Lewis, 1978). The UAE is listed as an area where the diseases are likely to occur due to the presence of the genera from which the disease-causing parasites have been isolated elsewhere. This suborder also includes mosquitoes, Anopheles, of which a number of species present in the UAE can transmit malaria (e.g. *Anopheles culicifacies*, *A. dthali*, *A. paltrinierii*, *A. sergentii* and *A. stephensi*) (Glick, 1992). However, towards the end of 2000, the Emirates was declared by the Ministry of Health to be clear of locally transmitted Malaria (Department of Preventative Medicine website). Blackflies, also known for disease transmission, are represented in the UAE, from Hatta, by *Simulium (Wilhelmia) buettikeri*.

Fig 2. The second Mydidae observed at Umm al-Qaiwain, a different species to that in Figure 1. Picture: Drew Gardner.

The most diverse family of the Brachycera in the UAE are bee-flies (Bombyliidae) represented by at least 50 species. They are often seen hovering low over the ground. Bee-flies vary in size from a few millimetres to having a wingspan of 3 cm (e.g. *Exoprosopa megerlei*). Asilidae (robber-flies) are usually found sitting on sand or vegetation observing their environment closely for potential prey. The most familiar flies are part of the Brachycera e.g. house-flies, fruit-flies, bluebottle flies, and hover-flies.

Most of the new records included in this list stem from the results of surveys undertaken to assess the environmental impact of development projects, although some records have been collected as a result of visits to Wadi Tarabat at the base of Jebel Hafit. Collecting methods have included flight interception trapping (malaise trapping), sweep-netting, and light trapping, using a mercury vapour light run from a portable generator. Specimens collected were pinned using standard entomological technique, and each data label associated with individual specimen includes at least the date, locality by name (usually accompanied by GPS coordinates), the collector's name, and the name of the person who has determined the specimen.

Although the presence of most new records listed are of no great surprise, either because they occur in neighbouring countries or because the habitat is particularly suitable, the two most notable sets of records are those of the Mydidae and Stratiomyidae. The first sighting of a member of the Mydidae was made on 14th September 2006 at Umm al-Qaiwain, (N 25.51866°, E 55.59565°) during night-time light trapping in Khor al-Beida, specifically in Khor Yfrah. Two females of different species came to the light, and only one was photographed (*Fig. 1*) and then captured. The next day at the same locality, another female was observed and photographed (*Fig. 2*), and a fourth female of the same species depicted in Fig. 2 was observed and captured. On 2nd October 2006, Richard Hornby observed a further female within the Shah oilfields (N 22.85228°, E 53.77838°) and photographed it (*pers. comm.*). This individual appears to be of the same species as is seen in Fig. 2. The final observation of Mydidae was made on 2nd October 2006 in Dubai within the area being developed for the Dubailand project (N 24.98911°, E 55.31231°), this being the first male to be observed (*Fig. 3*).

Thus far, despite considerable effort, identification to genus and species of the UAE Mydidae is not complete. Mydidae are a group that comprise only 65 genera worldwide with approximately 500 species (Dikow: Mydidae and Apioceridae website). All species tend to be found in desert or semi-desert environments, often associated with ancient dune systems. All UAE sightings confirm the latter.

In the United States, a species of Mydidae bordering on extinction was given conservation status 'endangered' in 1993 (US Fish and Wildlife Publication, 1993) due to the destruction of 97% of its habitat range. In 1997 a recovery plan was published to ensure its return from the brink of extinction (US Fish and Wildlife Publication, 1997).

Although the occurrence of Mydidae from different localities within the UAE suggests the family may not warrant such measures, ancient dune systems are disappearing, and without proper knowledge of all species that occur, many may be lost to the country, or, indeed, altogether, before they are recognised as being at risk.

The second notable record is that of several of the Stratiomyidae, or commonly, soldier-flies. These flies received their common name due to their appearance; their bright colours and stripes looking like the smart uniform of soldiers. Several individuals of one species were observed and collected on 8th May 2005 at Wasit Nature Reserve, Sharjah (N 25.36642°, E 55.47303°), being captured both in the flight interception trap and whilst visiting the light-trap. These individuals were subsequently identified as belonging to the genus *Nemotelus*. During a return visit a year later on April 24th 2006 to the same locality, the same species was seen and photographed (*Fig. 4*) but also yielded another species of *Nemotelus*, bringing the total to two for that genus.

Fig 3. The Mydidae in this image is a male. Males are much smaller and have more sections to the antennae. Picture: Drew Gardner.

Fig 4. *Nemotelus* feeding on the pollen of *Xygophyllum qatarense*. Picture: Drew Gardner

During a third visit to the site, though not exactly to the same locality (N 25.36345°, E 55.46716°) on April 28th 2006, both *Nemotelus* species were observed and a third soldier-fly was alsorecorded, being a identified as belonging to the genus *Odontomyia* (*Fig. 5*). The habitat at Wasit is that of a brackish body of water fed by non-brackish water, with adjoining dune habitat. Soldier-flies were observed very close to the water's edge. *Odontomyia* is usually associated with alkaline fresh water (i.e. water flowing from base-rich/limestone sediments). However, some species elsewhere in the World are found in damp areas behind sand dunes (dune slacks) such as are present at Wasit.

Nemotelus is typically associated with saltmarsh and salt pans in coastal areas. It was not surprising then, when this genera was also collected from Khor al-Beidah in Umm al-Qaiwain, on February 23rd 2007 (N 25.60897°, E 55.67203°). It is likely that species with narrow habitat ranges will be used in the future as indicator species.

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Fig 5. This species of Stratiomyidae, belonging to the genus *Odontomyia*, is visibly different to *Nemotelus*. Picture: Drew Gardner

Checklist of true flies (Diptera) from the United Arab Emirates

Suborder Nematocera

Limoniidae

Styringomyia ebejeri Hancock

Cecidomyiidae

Procontarinia matteiana Kieffer & Cecconi

Psychodidae

Phlebotominae

Phlebotomus (Phlebotomus) bergeroti Parrot

Phlebotomus (Paraphlebotomus) alexandri Sinton

Sergentomyia (Sintonius) adleri (Theodor)

Sergentomyia (Sintonius) clydei (Sinton)

Sergentomyia (Sergentomyia) antennata (Newstead)

Culicidae*

Anophelinae

Anopheles culicifacies complex

Anopheles dthali Patton

Anopheles paltrinierii Shidrawi & Gillies

Anopheles sergentii (Theobald)

Anopheles stephensi Liston

Anopheles turkhudi Liston

Culicinae

Ochlerotatus caspius Pallas

Culex pipiens Linnaeus

Culex pusillus Macquart

Culex sitiens Wiedemann

Culex tritaeniorhynchus Giles

Culex quinquefasciatus Say

Simuliidae

Simuliinae

Simulium (Wilhelmia) buettikeri Crosskey & Roberts

Ceratopogonidae

Leptoconopinae

Leptoconops (Holoconops) mellori Clastrier & Boorman

Leptoconops (Proleptoconops) bahreinensis Clastrier & Boorman

Forcipomyiinae

Forcipomyia (Euprojoannisia) psilonota (Kieffer)

Dasyheleinae

Dasyhelea deemingi Boorman & van Harten

Dasyhelea nigrina Clastrier, Rioux & Descous

Ceratopogoninae

Culicoides azerbajdzhanicus Dzhafarov

Culicoides iberiensis Boorman

Culicoides imicola Kieffer

Culicoides mesghalii Navai

Culicoides oxystoma Kieffer

Culicoides ravus de Meillon

Culicoides wardi Boorman

Chironomidae*

Chironominae

Chironomus calipterus Kieffer

Polypedilum (Polypedilum) bifurcatum Cranston

Suborder Brachycera

Stratiomyidae[n]

Stratiomyinae

Odontomyia sp.*

Nemotelinae

Nemotelus sp.*

Tabanidae*

Tabaninae

Tabanus rupinae Austen

Tabanus polygonus Walker

Therevidae*

Hoplosathe frauenfeldi (Loew)

Mydidae[n] *

Asilidae*

Asilinae

Apoclea femoralis (Wiedemann)

Stichopogoninae

Stichopogon sp.[n] *

Laphriinae

Lamyra vorax Loew

Bombyliidae*

Bombyliinae

Anastoechus niveus Hermann

Bombylella atra (Scopoli)

Bombylisoma senegalense (Macquart)

Bombylius megacephalus Porchinskii

Bombylius niveus Meigen

Bombylius pumillus Meigen

Systoechus horridus Greathead

Cythereinae

Cytherea albolineata (Macquart)

Cytherea alexandrina (Becker)

Cytherea delicata (Becker)

Cytherea fenestrata (Loew)

Anthracinae*

Anthrax dolgovskayae Zaitzev

Anthrax eremicus Evenhuis & Greathead

Anthrax trifasciatus Meigen

Caecanthrax arabicus (Macquart)

Petrorossia tropicalis Bezzi

Petrorossia albifacies (Macquart)

Desmatoneura brevipennis (Bezzi)

Desmatoneura sp.

Spogostylum candidum (Sack)

Spogostylum griseipenne Bessi

Spogostylum hippolytum (Wiedemann)

Spogostylum ocyale (Wiedemann)

Pachyanthrax circe (Klug)

Pachyanthrax nomadorum (Greathead)

Exoprosopa disrupta tihamae Greathead

Exoprosopa grandis (Wiedeman)

Exoprosopa (Honolonia) megerlei (Meigen)

Exoprosopa (Honolonia) mucorea (Klug)

Exoprosopa (Honolonia) olivieri (Macquart)

Heteralonia aeaca (Meigen)

Heteralonia bagdadensis (Macquart)

Heteralonia fallaciosa (Loew)

Heteralonia lugubris (Loew)

Heteralonia megerli (Meigen)

Heteralonia mucorea (Klug)

Heteralonia olivierii (Macquart)
Heteralonia singularis (Macquart)
Exhyalanthrax afer (Fabricius)
Exhyalanthrax beckerianus (Bezzi)
Villa (Thyridanthrax) decipula (Austen)
Villa (Thyridanthrax) perspicillaris (Loew)
Villa (Exhyalanthrax) beckerianus (Bezzi)
Villa nomadorum (Greathead)
Villa (Veribubo) angusteoculatus (Becker)
Villa (Veribubo) anus (Wiedemann)
Petrorossia albula Zaitzev
Petrorossia albifacies (Macquart)
Petrorossia tropicalis Bessi
Antoniinae
Antonia suavissima Meigen
Empididae
Syrphidae*
Syrphinae
Eupeodes luniger Meigen*
Paragus compeditus Wiedemann
Sphaerophoria sp.(n) *
Milesiinae
Eristalinus aeneus (Scopoli)*
Eristalinus megacephalus Rossi*
Eristalis (Eristalodes) taeniops Wiedemann*
Eumerus turcomenorum Paramonov
Pipunculidae(n) * **
Otitidae(n)
Otitinae
Melieria omissa (Meigen)*
Physiphora sp. ** ***
Tephritidae
Dacinae
Bactrocera dorsalis (Hendel)
Dacus ciliatus Loew
Dacus longistylus Wiedemann*
Dacus vertebratus Bezzi
Trypetinae
Carpomya incompleta (Becker)
Carpomya vesuviana Costa
Tephritinae
Trupanea amoena (Frauenfeld)
Goniurellia tridens (Hendel)(n) *
Goniurellia sp.(n) *
Agromyzidae*
Phytomyzinae
Liriomyza trifolii (Burgess)
Ophiomyza sp.
Limosininae
Telomerina sp.
Drosophilidae*
Drosophilinae
Drosophila sp.
Muscidae*
Muscinae
Musca crassirostris Stein in Becker
Musca domestica domestica Linnaeus
Musca domestica calleva Walker
Musca lucidula (Loew)(n) * ** ***
Musca sorbens Wiedemann
Phaoninae
Helina sexmaculata (Preyssler)(n) * **
Stomoxyinae
Stomoxys calcitrans Linnaeus
Calliphoridae
Calliphorinae
Lucilia sericata Meigen*
Chrysomyiinae
Chrysomya albiceps Wiedemann*
Chrysoma bezziana Villeneuve
Chrysomya regalis Robineau-Desvoidy*
Rhiniidae
Rhiniinae
Rhyncomya nigripes (?) Seguy (n)** ***
Villeneuviella sp.
Sarcophagidae
Miltogramminae(n) * **
Paramacronychiinae
Wohlfahrtia nuba (Wiedemann) *
Wohlfahrtia villeneuvei Salem(n) ** ***
Sarcophaginae
Sarcophaga ruficornis (Fabricius)*
Scenopinidae(n)
Proratinae
Prorates sp.*
Hippoboscidae
Hippoboscinae
Hippobosca longipennis Fabricius
Ephydridae(n)
Ephydrinae
Ephydra sp. * ** ***
Tethinidae(n) * ** ***

* Representatives of these species/genera/families are held in the private collection of the author, and some also in the collection of the joint Al Ain and Abu Dhabi Emirates Natural History Group collection, of which the author is the custodian.
** Determined by Nigel Wyatt, Diptera curator, NHM, London
*** Donated to the NHM, London
(n) This indicates new records. Where several species within a new family are also new records, these have then not been additionally marked as the symbol at the uppermost hierarchy of a new record suffices.

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Cutandia dichotoma (Forssk.) Trabut, a remarkable new species of annual grass for the UAE

by Gary Brown, Simon Aspinall & Drew Gardner

While surveying the White Bay area of Umm al-Qaiwain in February 2007, two of the authors (SA, DG) came across a distinctive, but unfamiliar grass in dunes immediately landward of the Umm al-Qaiwain to Ra's al-Khaimah road, just east of the "Dreamland" leisure complex. Several specimens were noted at the time and one was collected and shown to GB, who happened to be visiting to the UAE at the time. GB was able to identify the specimen (*Fig. 1*) immediately as *Cutandia dichotoma*, a species with which he is familiar from Kuwait.

C. dichotoma is superficially very similar to *C. memphitica*, particularly in respect of its zigzagging inflorescence, and is therefore easily overlooked. However, *C. dichotoma* is a generally smaller, more compact plant (branches of the inflorescence shorter than in *C. memphitica*), rarely exceeding 10 cm in height, whereas *C. memphitica* reaches up to 25 cm. Apart from general habit, the most useful distinguishing feature is the awnlike point at the apex of the lemmas in *C. memphitica*. This is lacking in *C. dichotoma* (*Fig. 2*), but quite distinctive and easily visible with the naked eye in *C. memphitica.* (*Fig 3*).

Previously, only *Cutandia memphitica*, also an annual, had been recorded from the UAE (Jongbloed, 2003). This species is generally widespread in low, non-saline dunes along a narrow coastal strip from Taweela in Abu Dhabi Emirate north-eastwards to Ra's al- Khaimah (Brown *et al.,* in prep.). It is particularly common after plentiful winter rainfall, but populations are distinctly smaller in dry winters. *Cutandia dichotoma* is likely to be more widespread in the UAE than this first single find suggests, possibly occupying a similar distribution to that of *C. memphitica*. However, it is undoubtedly a much rarer plant, and probably threatened by the massive development of coastal areas currently under way between Abu Dhabi and Ra's al-Khaimah.

Fig 1. *Cutandia dichotoma* - habit.

Cutandia dichotoma is not listed for Oman by Ghazanfar (1992), or Yemen by Wood (1997). Neither Collenette (1997) nor Mandaville (1990) appear to have recorded the species from Saudi Arabia. The only published record for the species in Saudi Arabia is by Migahid (1989), who mentions it from the Eastern Najd. However, according to Shaukat Chaudary, an internationally recognised expert on the Saudi Arabian flora, this record is likely to be erroneous. *C. dichotoma*, does, however, occur in Kuwait (Al-Rawi, 1987), and has been authenticated from a number of locations there. Most recently, GB found it to be abundant on Failaka Island (Kuwait) in early March 2007, and also found it to be fairly common on near-coastal, non-saline sandy plains in southern Kuwait near Nuwaiseeb, less than a kilometre from the Saudi border. As most of the stations listed by Al-Rawi (1987) for Kuwait are near the coast, it seems that this species has a distinct affinity for coastal, but non-saline habitats. Furthermore, it can be assumed that given the proximity of Nuwaiseeb to the Saudi border, the species must occur in suitable habitats in the northern-most part of Saudi Arabia at least, but probably not in the Eastern Najd. Bor (1968) describes it as rather rare in southern Iraq, but more common in the north.

The record for Umm al-Qaiwain is therefore remarkable, in that it represents the southern-most occurrence of the species in Arabia, some 800 km to the south-east (300 km south) from its next known station (Nuwaiseeb, Kuwait) in the Peninsula, although the species probably does occur somewhat nearer, in western Iran.

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Acknowledgements

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Fig 2. *Cutandia dichotoma* - inflorescence.

Fig 3. *Cutandia memphitica* - inflorescence.

Occurrence of the large mangrove mud creeper *Terebralia palustris* (Linnaeus, 1767) (Gastropoda; Potamididae) within the Arabian Gulf, at and near Qeshm Island, Iran, in the Strait of Hormuz

by Gary R. Feulner

Naturalists and archaeologists familiar with the UAE know very well that, despite the frequent presence of shells of the Potamidid gastropod *Terebralia palustris* in coastal deposits and archaeological contexts along the Arabian Gulf coast of the UAE, at various sites of various ages (Feulner, 2000; Gruber *et al*., 2005; Hellyer & Aspinall, 2006), this large and distinctive edible gastropod is not found alive in that area today. It is likewise absent in Qatar and Bahrain to the north, although it thrives at Khor Kalba on the Gulf of Oman coast of the UAE.

The reasons for the contemporary absence of *T. palustris* within the Arabian Gulf remain speculative. Elsewhere in the Indo-Pacific it is typically (Houbrick, 1991; Fratini *et al*., 2004), although not always (Feulner, 2000; Fratini, *pers. comm.*), closely associated with mangrove forests, so the reduced presence of mangroves in Qatar and Bahrain, where they are near the margin of their winter frost tolerance, has been tentatively invoked to explain the absence of *T. palustris* there. However, alternative explanations cannot be ruled out, including, *inter alia*: (1) extreme water temperature and/or salinity (both significantly elevated in the Arabian Gulf summertime); (2) the role of ocean currents on the dispersal and recruitment of pelagic larvae; (3) the over-exploitation of *T. palustris* (and perhaps associated mangrove forests as well) by earlier human populations; and (4) reduced freshwater input to the Arabian Gulf in general and the UAE's coastal lagoons in particular, due to increasing regional aridity.

In order to attempt to test these alternative hypotheses, I have previously suggested the possibility of identifying a natural laboratory, specifically, by "confirm[ing] (or deny[ing]) the presence of *T. palustris* in the extensive mangroves inshore of Qeshm Island, Iran, in the Strait of Hormuz. This site is more northerly than Bahrain but it is situated between the delta of the seasonal Mehran River and the mouth of the Kol River, where freshwater influx may remain relatively high in comparison to other southern Gulf locations" (Feulner, 2000). In fact, I thereafter attempted to join in a proposed visit to Qeshm Island in company with a group of other amateur naturalists, but satisfactory arrangements proved elusive.

Happily, Dr. Peter J. Hogarth of the University of York was kind enough to keep this suggestion in mind when he visited Iran in early 2005 for purposes of coastal ecological research. His itinerary included Qeshm island and, although he was unable to visit the principal mangrove areas at a suitable tide, he made inquiries as a result of which he was able to report that *T. palustris* does occur in Iran, in two locations (*Fig. 1*). The eastern one is on the mainland side of Qeshm Island and corresponds to an extensive mangrove area. The western area, however, to the west of Bandar-e Lengeh, is said to have no mangroves. This distribution information comes from Hosseinzadeh *et al.* (2001) as well as conversations with people who were familiar with *T. palustris* (Hogarth, *pers. comm.*)

Study of the physical and historical parameters of the *T. palustris* localities on Qeshm Island would be potentially instructive in understanding the absence of that species along the present day Arabian Gulf coast of the UAE. The Iranian population is also interesting in its own right, because it is among the most northerly of extant populations, along with those of the northern Red Sea and Okinawa, Japan (Houbrick, 1991).

Fig 1. Distribution of *Terebralia palustris* in Iran (from Hogarth, *pers. comm.*)

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More *Terebralia palustris* (Linnaeus, 1767) near Abu Dhabi

by Peter Hellyer & Simon Aspinall

In ***Tribulus Vol. 16.1*** (2006), the presence of shells of the large mangrove mud-creeper *Terebralia palustris* on archaeological sites and *in situ* in now-dried inter-tidal areas between the island of Futaisi, just west of Abu Dhabi City and northwards to Saih ash-Sha'ib, just across the Abu Dhabi - Dubai border was reported (Hellyer & Aspinall, 2006). It was noted that the archaeological sites were all wholly or mainly Late Islamic in date, in contrast to the situation on archaeological sites on the Arabian Gulf coast of the Northern Emirates, where the species is common or relatively common from the Late Stone Age to the late pre-Islamic period and then becomes increasingly less common. The species is believed to be extinct on the UAE side of Arabian Gulf today, although as noted elsewhere in this issue, live populations are still present on the Iranian side of the Gulf in the Strait of Hormuz (Feulner, 2006).

Ecological fieldwork undertaken by Simon Aspinall in November and December 2006 identified four further sites with *T. palustris* shells in the same general area of North-East Abu Dhabi.

One is a small midden of shells, with no associated archaeological artefacts, on a rocky outcrop (*qassar*) on the coastline at Ra's Ghanadha.

A second is on the offshore island of Jazirat Hayl, a midden composed primarily of *Pinctada* sp., (pearl oyster) with some shells of the large edible gastropod *Hexaplex kuesterianus* and of *T. palustris*. Late Islamic pottery from the Julfar horizon is present nearby.

The third and fourth sites are on the island of Ghurab, just south of Jazirat Hayl, and include a mound of burnt stones, with which *T. palustris* shells and Late Islamic pottery are associated, and another large burnt stone mound with unidentified mammal bones and with several large *T. palustris* shells. In the absence of any pottery or other artefacts, this latter site cannot be ascribed a date without radiocarbon dating. Where dated from elsewhere along the coast of Abu Dhabi, including on the island of Balghelam, close to Ghurab and Hayl, they have produced a range of dates from the middle Bronze Age to the Late Islamic period.

The discovery of the new sites is not unexpected and provide further evidence of the presence of *T. palustris* in a Late Islamic context in the north-east of the Emirate of Abu Dhabi. The questions as to why the species is, or was, present in only this part of Abu Dhabi Emirate, why it appears to have survived after it apparently disappeared from the Arabian Gulf coastline of the Northern Emirates and what finally caused its disappearance all remain to be answered.

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Goby Gone for Good

by Gary R. Feulner

Fig 1. The Hata goby (*Awaous aeneofuscus*) *ex situ*

Fig 2. A plastic-lined dam and 'weir' in Wadi Qahfi, now neglected but recently used for fishing

An early November 2006 visit to lower Wadi Qahfi, following intermittent rain in August, September and October, failed to turn up any sightings of the so-called Hatta goby (*Awaous aeneofuscus*) in the area it was known to inhabit from at least 1997 through mid-2004 (Feulner 1998; Feulner & Cunningham 2000). This appears to confirm the author's pessimistic assessment in July 2005 that the goby is now extinct in this area (Feulner 2005), which represented by far the largest of only four goby sites known in Northern Oman in recent years. As of mid-2004, the goby was already reported to be absent from two of the other sites, one in a nearby wadi, visited by the author in May 2004 and one in a wadi south of Muscat visited in June 2004 by Prof. Michael Robinson from Sultan Qaboos University. The fourth site was in the area north-west of Sur, where the wadis debouch almost directly to the sea, across only a very narrow coastal plain (Robinson, *pers. comm.*).

As many as 78 gobies were actually counted in Wadi Qahfi in March 2000 over a several kilometre stretch of wadi, and the local population was estimated at 100-200 fish (Feulner & Cunningham 2000). The area was monitored at least annually thereafter. Sightings dwindled to only five, with four in a single pool, in May 2004. This, it appears, was not enough to survive under the circumstances.

Several factors are likely to have contributed to this result. First, the exceptional drought of 1999-2004 (see Feulner 2006) reduced the number of pools, and water levels and flow rates in the remaining pools, reducing the quantity and quality of available habitat. Second, flowing water in the comparatively 'wet' winter of 2004-2005 rearranged three of the larger pools that had held a number of bigger gobies, filling them with gravel and diminishing both their size and depth. Third, on all visits since 2000, a period when the drought period permitted the maintenance of a reasonable vehicle track in the wadi, there has been evidence that the area of the goby pools is regularly visited for fishing purposes. That evidence consists of extensive damming and channeling, as well as the construction of fish weirs and abundant litter of cut-off mineral water bottles fashioned into fish traps, like mini-*gharghour*.

The fishing activity is probably directed at the traditional quarry of the local mountain residents, the small, dark *Garra barreimiae*, a carp family member that is the most common wadi fish. But it seems inevitable that the goby population must have suffered 'collateral damage' as a result. Moreover, since the goby is somewhat larger than the other native fish, and distinctive, it may have attracted attention from local fisherman as a novelty. In addition, since notice was drawn to them in 1998, gobies have also been collected from the site in unknown numbers by institutional and private collectors.

If in fact *A. aeneofuscus* has been eliminated from Wadi Qahfi, it is especially unfortunate, since the population there was essentially an isolated one. Owing to dam construction in Wadi Hatta and the high rate of water use in the Hatta area generally, it is unlikely that Wadi Qahfi (a tributary of Wadi Hatta) will again flow to the sea. That eliminates the possibility of recruitment of new fish from the seagoing population of fry, in accordance with the normal life cycle of the species (see Feulner & Cunningham 2000).

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TRIBULUS on line

Thanks to an initiative by the Al Ain Chapter of the Emirates Natural History Group, back issues of ***Tribulus*** have now been scanned and are available on-line.

Tribulus replaced the Bulletin of the Abu Dhabi branch of the Emirates Natural History Group in 1991.

With the permission (and grateful thanks) of the editors, Bob Reimer of the Al Ain Group has scanned all the issues of ***Tribulus*** and placed them on the Al Ain Group web site along with a combined index to Volumes 1 through 15. At the moment, full issues are available in two PDF formats. One is the definitive edition which consists of images of each page. The second, smaller version has been converted to text and images using Adobe Acrobat's Optical Character Recognition features so that it is searchable. This edition may have (probably does have) OCR errors that have not been corrected. A future phase of the project will be to correct the OCR errors and make individual articles available in PDF and HTML format.

The collection may be found by navigating through the ***Tribulus*** tab from the main page at **http://www.enhg.org.**

Erratum

In ***Tribulus Vol. 15.1***, (p. 19), the note 'A recent sighting of the Pomegranate Playboy butterfly, *Deudorix livia*, at Khutwah, Oman (Lepidoptera: Lycaenidae)' was credited to a single author, Omar Naseer, the name of the second author, Dr. Michael P.T. Gillett, having been inadvertently omitted. The error is regretted.

Short Notes

Arabian Oryx re-introduction

Over 95 Arabian Oryx *Oryx leucoryx* have been released into the wild in the south-east of the Emirate of Abu Dhabi by the Environment Agency - Abu Dhabi, EAD, in the first phase of a major re-introduction scheme. According to EAD's Secretary-General, Majid Al Mansouri, "*this reintroduction is part of EAD's long term commitment to conserve our precious biodiversity. The project will be termed a success when the status of this beautiful creature, in the wild, is significantly improved. Our Terrestrial Environment Research Center has been releasing these oryxes in hopes to create a self-sustaining population that roams freely in our deserts.*"

Over the next four years, a further 100 captive-born Arabian oryx individuals will be released during the cooler months into suitable sites in the Emirate of Abu Dhabi. The sites cover a total of 10,000 sq. km and the Agency has already submitted a proposal to the Abu Dhabi Executive Council to declare this area a Protected Area. Meanwhile, following each release, monitoring of the animals will continue and the Agency's Desert Rangers will patrol the area.

EAD selected the release sites very cautiously, based on several criteria. More than 30 shelters and feeding stations have been temporarily installed to provide the oryxes with shade and water. This is also done to support the oryxes in their learning process of surviving in the wild. These shelters and feeding stations will be gradually removed as the oryx learns to depend on its natural environment for survival, as it did years ago in the UAE.

Al Ain Zoo has been a strategic partner throughout the project. The Zoo helped in selecting the release areas, building the fences, transportation of the animals and even donating some oryxs from the zoo. The Zoo also helped to prepare the oryxs for release, in terms of medical check ups and necessary vaccinations.

Historically, the Arabian oryx roamed in the Nafud and the Empty Quarter (Al Rub' Al Khali). The northern Nafud population ranged over the entire northern shield of the Arabian Peninsula including the western part of UAE, in the Manasir, Dhafra and Liwa areas, their range extending into the Ru'b al-Khali. The Arabian oryx also had a range covering Palestine, Syria, Jordan and Iraq.

In the early 1960s, the late Sheikh Zayed bin Sultan Al Nahyan arranged, just in time, for the capture of two breeding pairs of the Arabian Oryx for the nucleus of a captive-breeding programme. Hunting and habitat destruction were the main reasons behind the disappearance of the oryx

Today, the UAE hosts the largest group of Arabian oryx in the world with approximately 4,000 in the country.

The first reintroduction project for the Arabian oryx was in the Sultanate of Oman during the mid 1980s eventually faltered because of poaching. Further reintroduction projects into large fenced reserves have also taken place in Saudi Arabia. (*Source: EAD Press Release*)

RAKBANK sponsors Ra's al Khaimah nature reserve study

The National Bank of Ras al Khaimah has generously sponsored a series of biodiversity studies at the Hulayla mangrove wetland in Ras al Khaimah. These studies have been coordinated by the Government of Ra's al Khaimah's Environment Protection and Industrial Development Commission, EPIDC.

The information gathered is being used to prepare a proposal for establishing a Hulayla Nature Reserve, which will be presented in early 2007 to the Crown Prince and Deputy Ruler of Ra's al Khaimah, HH Sheikh Saud bin Saqr al Qassimi.

The Hulayla wetland is unique in the UAE and Arabian Gulf because it is a vital spawning and nursery ground for commercial fish, and is nationally and internationally important as a feeding site for resident and migratory birds. It also possesses a regionally unique coastal vegetation community and its scenic importance and rich archaeological heritage add further value and tourism potential. (*Source: EPIDC, Ra's al-Khaimah*)

Dugongs seen off Dubai

The November 2006 issue of the newsletter of the Dubai Natural History Group, **The Gazelle**, (**Vol. 21.11**), reported an important marine mammal sighting off the Dubai coast, near the Jumeirah Beach Hotel, on 17th October 2006, a group of dugongs, *Dugong dugon*.

Live dugongs have not been reported from Dubai for many years. Perhaps the group had come north-eastwards from their main Arabian Gulf stronghold around the island of Marawah in Abu Dhabi's Western Region? Or is there still a small and secretive population in the Northern Emirates, perhaps in the vicinity of Khor al-Beida, in Umm al-Qaiwain?

The report, by Martina Fella, was as follows:

"I thought it might be of some interest to the DNHG that yesterday morning (17th October) we saw a group of dugongs only a few hundred metres from the shore, in front of the open beach next to the Jumeirah Beach Hotel. They were definitely dugongs and not dolphins.There were about 10-12 animals, amongst them also young ones. We observed them from our boat, (a catamaran) but they seemed very shy and it was difficult to approach them closely, (although at one point we got as close as about 5 metres).

After watching for more than half an hour, we decided it was best to leave them alone again. We had the impression that the dugongs had lost orientation as they kept moving back and forth within the same area."

With the very extensive offshore construction and dredging in this area, with much noise from these activities, as well as the disturbance to underwater visibility and to feeding grounds, like seagrass beds, a loss of orientation certainly seems likely!

(*Source: The Gazelle*)

Launch of new ornithological journal - Podoces.

The first issue of the West and Central Asian Ornithological Journal, '**PODOCES**', was published late in 2006. It is named after Pleske's Ground Jay (*Podoces pleskei*), a resident Iranian endemic. Papers are in English, with their abstracts also in Persian, or vice versa, while short communications appear in both English and Persian. The editorial board has embraced the issue of language and the journal succeeds well in both lay-out and accessibility of the material, whichever your preferred language. Currently bi-lingual, papers written in Russian are to appear in future issues.

A range of papers in the first issue cover such topics as the status of houbara in Iran, tracking vultures in the Caucasus, various breeding and wintering bird surveys and a case of avian cholera. Short communications cover unusual sightings (including snowy owl and waxwing, both in Iran) and miscellaneous observations, status reports and the results of various surveys (e.g. larks feeding on oilseed rape) amongst other subjects.

Published by WESCA, Wildlife Network & Bird Conservation Society for Iran, the first issue is dominated by Iranian topics and includes an updated bird checklist for the country.

The editor, Abolghasem Khaleghizadeh, may be contacted at the following e-mail address: akhaleghizadeh@yahoo.com.

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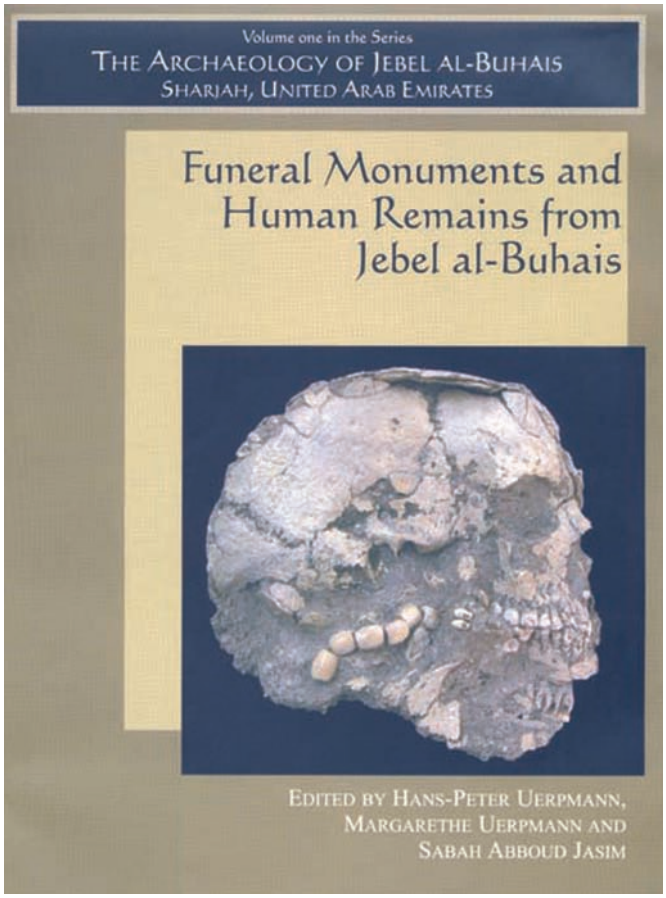
Coleoptera

Conrad Gillett, the son of our Advisory Board member and frequent contributor Michael Gillett (and a contributor himself) has recently been appointed to the post of Curator of Coleoptera in the Department of Entomology at London's Natural History Museum. During his work, we hope that he will keep a close eye on UAE-related matters!

For those readers who may wish to contact him, his e-mail address is: c.gillett@nhm.ac.uk

Book Reviews

Funeral Monuments and Human Remains from Jebel al-Buhais. The Archaeology of Jebel Al-Buhais, Sharjah, United Arab Emirates, Vol.1.



Hans-Peter Uerpmann, Margarethe Uerpmann and Sabah Abboud Jasim (*eds.*), 2006. Department of Culture & Information, Government of Sharjah, UAE, Institut für Ur- und Frühgeschichte und Archäologie des Mittelalters Universität Tübingen, Germany, and Kerns Verlag, Tübingen. 385 pages. Hardback. ISBN: 3-935751-06-0

This volume is the first in a series of volumes covering the archaeology, natural environment and ancient cultures of Jebel Buhais. It is intended to present an overview of the explorations carried out by the Sharjah Directorate of Antiquities, in cooperation with the Institut für Ur- und Frühgeschichte und Archäologie des Mittelalters Universität Tübingen, Germany.

Volume 1 largely concerns the description of human remains from the numerous grave structures found in this area. It is divided into three parts:

Part 1, written by Sabah Abboud Jasim, discusses "The Archaeological Sites of Jebel Al-Buhais" (pages 13-63). It provides an overview of the archaeology with clear plans, photographs and illustrations of the excavated material which dates to the Neolithic, Hafit, Wadi Suq, Iron Age and Hellenistic periods. The astounding continuity of funeral sites in the al-Buhais area throughout different prehistoric periods is quite remarkable.

Part 2, written by Adelina Uerpmann, Johannes Schmitt, Nicole Nicklisch and Michaela Binder, discusses "Post-Neolithic Human Remains from the Jebel Al-Buhais Area" (pages 69-99). They summarise the results of material excavated by the Sharjah team between 1994-1995, as well as material collected from the open sites by the Joint Al-Buhais Project from 1996 to 1999. It provides a significant amount of evidence linking the area to the known developments of human populations in the wider Gulf region during the Bronze and Iron Ages.

Part 3, written by Henrike Kiesewetter, forms the major component of this volume. Entitled "Analyses of the Human Remains from the Neolithic Cemetery at al-Buhais 18 (Excavations 1996-2000)" (pages 103-265), she presents a detailed study of the skeletal remains from the cemetery which formed her PhD thesis at the University of Tübingen.

Appendix A is a catalogue of all the burials analysed in part 3 (pages 267-331).

Appendix B are all the data tables pertaining to part 3, including details of all preservation, sex and age information, bone measurements and non-metrical traits (pages 333-380). An index completes the volume (pages 381-385).

The discovery of the Neolithic graveyard of Al-Buhais 18 was a major event in the history of archaeological research in southeastern Arabia. It provided for the first time a window onto the early inhabitants of this region. The human remains buried some 6000 to 7000 years ago were often adorned with a fascinating range of personal adornments.

This monograph represents the results of ten field seasons which took place between 1996 and 2005. Both the Directorate of Antiquities of the Department of Culture and Information of the Government of Sharjah, as well as the Institute of Pre- and Protohistory and Medieval Archaeology of the University of Tübingen, should be congratulated for the production of this handsome volume. It sets new standards for archaeological publication in the United Arab Emirates. Systematic anthropological analyses of human remains from southeastern Arabia are still relatively scant. This detailed study provides valuable new information about the Neolithic herders, fishers and foragers of the region, as well as the Bronze and Iron Age agriculturalists and craftsmen.

As Henrike Kiesewetter writes in the concluding sentence to the volume she is "fortunate at having made a contribution to the understanding of the lifeways, the subsistence and living conditions of the early inhabitants of the Oman peninsula".

Mark Beech

A. van Harten (2005). Insects of the UAE: A Checklist of Published Records. Dar Al Ummah, Abu Dhabi

The title encompasses the scope of this book; it brings together almost all known records from the literature into one source. The introduction sets the stage as to why records in the UAE are 'relatively unexploited', i.e. the lack of targeted cataloguing.

Van Harten mentions the lack of national collections and whilst, to some extent this is correct, the collection at the Environmental Agency Abu Dhabi (EAD) is significant, and the private collection of the combined Al Ain and Abu Dhabi ENHGs are also important in their contribution to entomological knowledge.

The objective of the book, however, is to clearly list known species. To that end, each species name is accompanied by its original author, the year of description, and every reference where the record was published. As the compilation is truly meant to be a species list, there are no illustrations or photographs. The classification used adheres mainly to that used by 'Fauna Europaea' with species listed in alphabetical order within families.

The records are comprehensive but not all inclusive. Records published in the predecessor of ***Tribulus***, the *Bulletin of the Abu Dhabi Natural History Group*, have been ignored. The reasons are understandable. Records where specimens are not present for verification cause a problem. Misidentifications are commonplace. Furthermore, frequently additional knowledge on the classification of certain groups forces re-examination of specimens and, if those are missing, the record becomes suspect. Interestingly, records subsequently appearing in refereed journals (the *Bulletin* was not refereed) have often confirmed records originally quoted in the 'Bulletins'. This season the specimens collected and reported by the authors of the *Bulletin* records were re-discovered in storage, which will allow the *Bulletin* records to be validated. Therefore, rather more recorded species exist in the UAE than are listed in the book, including species lists submitted for publication which have not yet made it to press but precede the publication under discussion.

Despite the occasional typographical errors (e.g. in year of description by original authors, misspellings of species names and original authors), and the unfortunate switch of Gillett and Howarth (2004) to Howarth and Gillett (2004) throughout, the book is useful for those studying the biodiversity of insects in the UAE as UAE records are scattered throughout the literature. *Insects of the UAE* ensures that most knowledge to date is consolidated in one place and forms a sound foundation for extending our records of UAE insects in the future.

Brigitte Howarth

Discovering Qatar by Frances Gillespie
2006. Softback, 148 pp. with photographs on every page.

Buy it, read it, and you certainly will discover Qatar.

The author, Fran Gillespie, has lived in our neighbour, Qatar, for over twenty years and has devoted her time profitably to studying the archaeology and natural history of her adopted home. In this, her first solo title, she has done well to distill the essence of the country into a solid, informative read. It has an easy style which means you can just dip into individual chapters in any order, that's if you don't get so engrossed that you read it cover to cover in one go.

The history of Qatar, the significance of the colour purple (and the gastropod source of the dye), boat petroglyphs, pearling, abandoned ancient settlements, forts and various other archaeological and historical interest vie with later chapters which describe the formation of dunes, singing sands, place-names, truffle-hunting, tracking wildlife, miscellaneous indigenous land mammals, reptiles, scorpions and camel spiders, turtles, sea-snakes, marine mammals and more besides, such as stonefish, stingrays and lion fish, but not forgetting mangroves, ospreys, Socotra cormorants……

See, I told you: this is a jam-packed volume, full of anecdote and unusual facts and well-worth the read. And it will complement nicely any titles from the Motivate series on UAE subjects that you may happen to have.

Sponsored by RasGas Company Ltd., this book is available from the author for 100 dhs plus p&p via: gillespi@qatar.net.qa or tel. +974-4675991. (A copy has been lodged in the ENHG library for anyone who cares to view before purchasing).

I thoroughly recommend it.

Simon Aspinall

Publications

Books

Reem Tariq el Mutwalli. 2007. Qasr Al Husn - 2nd edition. Abu Dhabi Authority for Culture and Heritage - Cultural Foundation, Abu Dhabi. ISBN: 9948-01-145-7. Price: 50 UAE Dirhams. Softback. 131 pages. Bi-lingual: Arabic and English. Includes a booklet with 12 maps and plans.

This publication is based on an unpublished manuscript written by the author during the course of a Master of Arts degree from the School of Oriental and African Studies, University of London, completed in 1992. It provides very useful documentation about the 'Old Fort' in Abu Dhabi. The Qasr al-Hosn is currently the subject of extensive historical, archaeological, and architectural research by the Abu Dhabi Authority for Culture and Heritage, with plans afoot to create a new museum there.

Articles & Papers

(*compiled by Mark Beech and Peter Hellyer*)

The following published papers dealing with the UAE and adjacent areas have been received or noted.

Archaeology

Arabian Archaeology and Epigraphy Vol. 17.2 (Nov 2006). Blackwell Publishing. Print ISSN 0905-7196. Online ISSN: 1600-0471
Web:
http://www.blackwellpublishing.com/journal.asp?ref=0905-7196&site=1

Parker, A.G., G. Preston, H. Walkington and M.J. Hodson, 'Developing a framework of Holocene climatic change and landscape archaeology for the lower Gulf region, southeastern Arabia' (pp. 125-130).

Diedrich, C.G., 'Discoveries of Neolithic prehistoric sites at Pleistocene carbonate rock shelters on the east coast of the UAE' (pp. 131-138).

(A report on finds from rock shelters at Al Aqqah and Qurayyah, which have produced the first confirmed presence of Neolithic sites in Fujairah (although others are known from Khor Kalba, also in the UAE East Coast, but in the Emirate of Sharjah).

Littleton, J. and Frifelt, K., 'Trepanations from Oman: A case of diffusion?' (pp. 139-151).

Ziolkowski, M.C. and A.S. Al-Sharqi, 'Dot-in-circle: An ethnoarchaeological approach to soft-stone vessel decoration' (pp. 152-162).

Delrue, P., 'Ring-pommel daggers from ed-Dur (Umm al-Qaiwain, U.A.E.): An archaeo-metallurgical and typological analysis' (pp. 201-213).

Jasim, S.A., 'Trade centres and commercial routes in the Arabian Gulf: Post-Hellenistic discoveries at Dibba, Sharjah, United Arab Emirates' (pp. 214-237).

(A report on excavations at Dibba, whose finds lead the author to suggest that Dibba, rather than Ad-Door (ed-Dur) was the site of the early port of 'Omana').

King, G., 'Delmephialmas and Sircorcor: Gasparo Balbi, Dalmâ, Julfâr and a problem of transliteration' (pp. 248-252).

Proceedings of the Seminar for Arabian Studies 36 (2006).
Papers from the thirty-ninth meeting of the Seminar for Arabian Studies, edited by Rob Carter and St John Simpson. ISBN 190573901X. Price £45.00.

299 pages; numerous figures, plans, maps, drawings and photographs. To order this volume please contact:
Archaeopress, Gordon House, 276 Banbury Road, Oxford OX2 7ED, UK. Tel/Fax: +44 (0) 1865 311914. Email: bar@archaeopress.com. Web: www.archaeopress.com/

This includes the following papers of local relevance:

Boussa, D., 'A future to the past: the case of Fareej Al-Bastakia in Dubai, UAE' (pp. 125-138).
De Beauclair, A., S.A. Jasim & H-P. Uerpmann, 'New results on the Neolithic jewellery found at al-Buhais 18, UAE' (pp. 175-187).

Hawker, R.W., 'Tribe, house style and the town layout of Jazirat Al-Hamra, Ras al-Khaimah, UAE' (pp. 189-198).

Parker, A.G., C. Davies & T. Wilkinson, 'The early to mid-Holocene moist period in Arabia: some recent evidence from lacustrine deposits in eastern and south-western Arabia' (pp. 243-255).Usai, D., 'A fourth-millennium BC Oman site and its context: Wadi Shab-GAS1' (pp. 275-288).

Other Papers

Magnani, G., Bartolomei, P., Cavulli, F., Esposito, M., Marino, E.C., Neri, M., Rizzo, A., Scaruffi, S. & Tosi, M. (2007).' U-series and radiocarbon dates on mollusc shells from the uppermost layer of the archaeological site of KHB-1, Ra's al Khabbah, Oman'. **Journal of Archaeological Science** 34: 749-755.

Parker, A.G., Goudie, A.S., Stokes, S., White, K., Hodson, M.J., Manning, M. & Kennet, D. (2006). 'A record of Holocene climate change from lake geochemical analyses in southeastern Arabia'. **Quaternary Research** 66: 465-476.

Architecture

Hadjri, K. 2006. 'An analysis of the spatial structure of a new desert town: Al Ain, United Arab Emirates'. **Urban Design International 11**: 3-19.

Botany

Ismail, B., Haffar, I., Baalbaki, R., Mechref, Y. & Henry, J. 2006.' Physico-chemical characteristics and total quality of five date varieties grown in the United Arab Emirates'. **International Journal of Food Science and technology 41**: 919-926.

Mandeel, Q.A. & Al-Laith, A.A. 2007. 'Ethnomycological aspects of the desert truffle among native Bahraini and non-Bahraini peoples of the Kingdom of Bahrain'. **Journal of Ethnopharmacology 110 (1)**: 118-129.

Entomology

Pittaway, A.R.,Larsen, T.B., Legrain, A. Majer, J., Weidenhoffer, Z. & Gillett, M. (2006). 'The establishment of an

American butterfly in the Arabian Gulf: *Brephidium exilis* (Boisduval, 1852) (Lycaenidae)'. **Nota Lepidopterologica**, **29** (1/2): 5-16.

Rejzek, M., Gillett, C.P.D.T., Driumong, A. & Gillett, M.P.T. (2005). 'On the distribution of the Genus *Anthracocentrus* Quention & Villiers, 1983, in the 'Persian' Gulf region (Coleoptera, Cerambycidae, Prioninae)'. **Lambillionea, CV**, 3: 353-370.

Environment

Siebert, S., Nagieb, M. & Buerkert, A. (2007). 'Climate and irrigation water use of a mountain oasis in northern Oman'. **Agricultural Water Management 89(1-2)**: 1-14.

Geology

Abdelghany, O. 2006. 'Early Maastrichtian larger foraminifera of the Qahlah Formation, United Arab Emirates and Sultanate of Oman border region'. **Cretaceous Research 27**: 898-906.
Howari, F.M., Baghdady A. & Goodell P.C. 2007. 'Mineralogical and geomorphological characterization of sand dunes in the eastern part of United Arab Emirates using orbital remote sensing integrated with field investigations'. **Geomorphology 83**: 67-81.

Robinson, C.A., El-Baz, F., Kusky, T.M., Mainguet, M., Dumay, F., Al Suleimani, Z. & Al Marjeby, A. 2007. 'Role of fluvial and structural processes in the formation of the Wahiba Sands, Oman: A remote sensing perspective'. **Journal of Arid Environments 69(4)**: 676-694.

Mammals

Murdoch, J.D., Drew, C, Barcelo Llanes, I, & Tourenq, C. (2007). 'Rüppell's foxes in Al Dhafra, United Arab Emirates'. **Canid News, Vol. 10**. Published by the IUCN/SSN Canid Specialist Group. ISSN 1478-2677
This paper can be found at:
http://www.canids.org/canidnews/10/toc10.htm

Ornithology / Birds

Falco, Newsletter of the Middle East Falcon Research Group. c/o: Dr. Tom Bailey, Dubai Falcon Hospital, PO Box 23919, Dubai. E-mail: tombailey@dfh.ae http://www.falcons.co.uk ISSN: 1608-1544.
Several papers by locally-based veterinarians and researchers, or otherwise of local relevance, are included in the following issues.

No. 27, February 2006.

Joerg Kinne & Ulrich Wernery (both from the Central Veterinary Research Laboratory, Dubai) 'Amyloidosis - an emerging disease in hunting falcons in the Middle East'. jkinne@cvrl.co.ae

Peter McKinney & Barbara Arca-Ruibal (both from the Wildlife Protection Office, Dubai). 'Prevalence of Aspergillosis in newly-purchased falcons in Dubai.
birdvetmckinney@gmail.com.

No. 28, August 2006.

Two interesting papers on research carried out in Central Asia with support from the Environment Agency - Abu Dhabi, EAD.
Westerbjerg Andersen, M. 'Occurrence of wintering Sakers in Kyrgyzstan (7-9).
Dixon, A. Notes from the field in 2006'. (10-14).
Studies on respiratory diseased in falcons (carried out partly in Dubai).
Prieto, M. Bailey, T. and Samour, J.An Evaluation of the Endurance Test as an Indication of Respiratory Diseases in Falcons'. (16-19).

Plus:
Wernery, U. 'Avian influenza'. (19-20)
Perry, L.S. 'The UAE Falcon Passport'. (20-21)
Bailey, T. and Di Somma, A. 'Time to Upgrade the Falcon passport to include Vaccination Information?' (21)

Plus a letter on 'Avian Influenza Vaccination in Falcons' from four authors, including three in Dubai (23-24), and a summary of the discussions of the Vulture and Eagles Group discussion at the 2005 'Conservation Workshop of the Fauna of Arabia', held at the Sharjah Desert Wildlife Park.

The Phoenix, No. 23, January 2007. ISSN 0268-487X. Compiled by Michael Jennings, (Co-ordinator, Atlas of the Breeding Birds of Arabia, ABBA). Warners farm House, Warners Drove, Somersham, Cambridgeshire, PE28 3WD, UK. arabianbirds@dsl.pipex.com

Is it really 23 years since Mike Jennings began this mammoth project? Plenty of short notes related to the UAE in the latest issue, including:

Aspinall, S. 'UAE Cattle Egret colony finally unveiled', p. 2

Anon (i.e. Mike Jennings). 'New Breeding Exotic: Yellow-crowned Bishop'. pp. 2,4

Jennings, M. 'Sykes' and Clamorous Warblers at Khor Kalba'. p. 4

Aspinall, S. 'The 2006 UAE Empty Quarter Shorebird Survey (Kentish plovers breeding in the Shah oilfield)'. p. 6

Javed, S. & Khan, S. 'Satellite tracking of Greater Flamingos from the UAE'. p. 7

Jennings, M. 'Sharjah Conservation Workshop on Arabian Fauna'. p. 15. (Including estimated populations of some breeding raptors and owls).

Asif, M.A. 'The red-wattled lapwings of Khor Dubai'. pp. 15-16.

Jennings, M. 'Wadi Bei - Wadi Khabb Shamsi - UAE/Oman'. pp.20-21. (Notes on the birds of the Wadi Bih).

British Birds. Vol. 99, pp. 545-600. November 2006. ISSN 0007-0335.

Aspinall, S. & Hellyer, P. (2006). 'Important Bird Areas of the United Arab Emirates'. pp. 546-561.

An unusual place for a UAE-related publication! This issue contains a lengthy review of the status of the UAE's important Bird Areas, as defined by Bird Life International, looking at the changes (both negative and positive) since the publication of the Bird Life IBA list in 1994.

Sandgrouse. Ornithological Society of the Middle East, c/o The Lodge, Sandy, Beds., SG19 2DL, UK. ISSN 0260-4736. Vol. 28 (2). 2006.

Richardson, C. (2006). 'Conservation Issues in the United Arab Emirates - a personal view'.

A salvo of doom and despondency from the former Chairman and Secretary of the Emirates Bird Records Committee, effectively saying that, in his view, all is lost (The Editors of *Tribulus* beg to disagree, with a response due to be published in a 2007 issue of the same journal.

Palaeontology

Stewart, J.R. & M. Beech. (2006). 'The Miocene birds of Abu Dhabi (United Arab Emirates) with a discussion of the age of modern species and genera'. **Historical Biology 18(2)**: 103-113.

Conferences

The annual Seminar for Arabian Studies was held at the British Museum from 27-29 July 2006. Papers relating to the UAE and neighbouring areas were as follows:

Richard Cuttler, Heiko Kallweit, Mark Beech, Anja Zander, Will Pitt & Walid Yasin al-Tikriti: 'Neolithic Tombs, Burnt Mounds and Flints in the Desert: Recent Work in the Umm az-Zamul Region of Abu Dhabi Emirate, UAE.'

Vincent Charpentier: 'Les niveaux VIe millenaire de Suwayh SWY-1, Sultanate of Oman'.

Juergen Schreiber: 'Transformation processes in oasis settlements in Oman 2005 - final stage: Archaeological survey at the oasis of Nizwa'.

Moawiyah Ibrahim & Badar Al-Alawi: 'Investigations at Wadi Bani Kharous, Sultanate of Oman'.

Tom Vosmer: 'Riding the Crest: lessons from the loss of the Magan Boat'.

Kathleen McSweeney & Sophie Mary: 'A Tale of Two Tombs: an anthropological and artefactual evaluation of the collective Umm an-Nar graves, Hili N and Tomb A Hili North, Al Ain, Emirate of Abu Dhabi, United Arab Emirates'.

Aviva Klein-Franke: ' The Jewish cemetery at Sohar, Oman - revisited'.

An de Waele: 'The beads of ed-Dur (Umm al-Qaiwain, UAE)'. Parsival Delrue, David De Muynck, Pieter Rogiers & An De Waele: 'Preliminary results of Compositional Analyses on SE-Arabian Coins from Ed-Dur (Umm Al-Qaiwain, UAE)'.

Margareta Tengberg: ' Vegetation History and Wood exploitation at Kush, Ras Al-Khaimah, UAE: Results of the charcoal analysis'.

Harrier Nash: 'Star Gazing in Traditional Water Management: a case study in Northern Oman'.

تريبيلوس

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