The HERPETOLOGICAL BULLETIN

Number 72 – Summer 2000

Addition to Egypt's herpetofauna • Behavioural interactions of Slow-Worms • Herpetological observations in Australia • Mallorcan Midwife Toad recovery programme • Reproductive behaviour of Sand Lizards • Herpetofaunal expedition to newly established park in Honduras.

THE HERPETOLOGICAL BULLETIN

The **Herpetological Bulletin** (formerly the British Herpetological Society Bulletin) is produced quarterly and publishes, in English, a range of features concerned with herpetology. These include full-length papers of mostly a semi-technical nature, book reviews, letters from readers, society news, and other items of general herpetological interest. Emphasis is placed on natural history, conservation, captive breeding and husbandry, veterinary and behavioural aspects. Articles reporting the results of experimental research, descriptions of new taxa, or taxonomic revisions should be submitted to The Herpetological Journal (see inside back cover for Editor's address).

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6. The Editor is keenly aware that contributors may find some of these instructions difficult to comply with and is anxious that the pages of the Bulletin should remain open to as wide a range of correspondents as possible. Therefore, if an author has concerns about the suitability of a manuscript, or would like help in preparing it, please contact the Editor to discuss.

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All submissions and correspondence arising from the Bulletin should be sent to the Editor, Peter Stafford, c/o Dept. of Botany, The Natural History Museum, Cromwell Road, London, SW7 5BD. *E-mail: pjs@nhm.ac.uk*

Front cover illustration
Tiger Rat Snake, *Spilotes salvini (= S. pullatus)*, from an original lithographed plate in Biologia Centrali Americana (Reptilia and Batrachia) by Albert C.L.G. Günther, 1902. Reproduction courtesy of The Natural History Museum, London.

EDITORIAL

A new-look Bulletin

Regular readers of the Bulletin will have noticed that in this edition, the first I have put together as its new editor, a number of changes have been made. After consultation with Council it was widely felt that its appearance was beginning to look a little dated, and with the recent change in editorship this seemed to be as good a moment as any to give it a facelift. I very much hope you will find the 'new-look' version agreeable. Perhaps the most 'contentious' of the changes is the different name. Calling it simply *The Herpetological Bulletin* does in my view, however, better reflect the now distinctly international scope of its content and author-base, and brings it more into line with *The Herpetological Journal*, the name of which changed from the *British Journal of Herpetology* in 1985 for similar reasons. In planning these changes I have, as mentioned, sought approval from Council and also the opinions of other members, but the decision to implement them has been ultimately my own and I accept full responsibility of course for any shortcomings.

One of the less obvious changes that warrants some elaboration is the way in which the Bulletin will now be produced. In the past, copy-typing and typesetting have been previously undertaken by the printer, but in an effort to cut down on costs I hope to undertake at least some of this work myself. This means that the Bulletin will be typeset directly from computer diskette, so it is even more important that wherever possible articles are submitted by this means - hand-written contributions will still be accepted, but due to the extra time involved in having to copy-type these there may be some delay in publishing them.

Erratum and apology

Hypomelanism in the Sand lizard, *Lacerta agilis*, by Lumír Gvoždik, Bulletin Number 70, 20-22.

The captions to Figs. 1 and 3 in this article (page 21) were unfortunately transposed. Fig. 1 shows a typically coloured female *L. agilis*, and Fig 3. a hypomelanistic one. The cover photograph also shows a normal coloured specimen and not a hypomelanistic one as indicated. We apologize for this and also a number of typographical errors that appeared in the article. It has not usually been possible in the past to provide authors with an opportunity to check their typeset manuscripts, and so mistakes of this nature have perhaps inevitably 'slipped through' undetected from time to time. The situation is clearly far from ideal, however, and I hope shortly to find a means of providing authors with page proofs.

Have you made any unusual observations of amphibians and reptiles? Do you have other information that sheds light on the natural history of a particular species?

The Herpetological Bulletin is to begin featuring an occasional section entitled **Natural History Notes**, which will include articles documenting original observations made of amphibians and reptiles mostly *in the field*. This will be produced along similar lines to the 'Natural History Notes' series currently published in Herpetological Review (Society for the Study of Amphibians and Reptiles, USA) and newsletter of the Herpetological Association of Africa. Surprisingly little seems to be known concerning the natural lives of even some common amphibians and reptiles, so if you have seen something of interest - perhaps, for example, you have recently been on

holiday and spotted a little-known species of lizard engaged in some form of unreported territorial behaviour, or found an aberrantly marked snake while conducting fieldwork in some far-flung corner of the tropics - then please consider supporting the Bulletin with a contribution for this new series. Articles should be concise and may consist of as little as two or three paragraphs, although ideally will be between 400 and 500 words.

Preferred contributions should represent an observation made of a free-living animal with little human intrusion, and describe a specific aspect of natural history. Information based on a captive observation should be declared as such in the text and the precise geographical origin of the specimen stated. With few exceptions, an individual 'Note' should concern only one species, and authors are requested to choose a keyword or short phrase which best describes the nature of their observation. Articles should be submitted in hard copy form (2 copies of manuscript, double-spaced), AND on computer diskette. Information should be presented in the following order and format:

SCIENTIFIC NAME (English common name – the abbreviation NCN should be used where none is recognised). KEYWORD. Description of observation [this should include date, time and place (with full map co-ordinates if possible), precise data on the nature of the observation with some discussion of its significance, and references to any pertinent literature]. If the information relates to a preserved specimen, its catalogue number and place of deposition should also be given. Then leave a line space and close with SUBMITTED BY (give name and address in full).

Peter Stafford

ARTICLES

A NEW ADDITION TO EGYPT'S HERPETOFAUNA: *COLUBER ALGIRUS* (JAN, 1863)

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Despite the long history of herpetological investigation in Egypt, new taxa are still being added to the country's herpetofauna regularly, reflecting on one hand the rarity of some of the species, and on the other the limited geographical scope of past work. Egypt's snake fauna is, hitherto, composed of 36 species. Most recently *Ramphotyphlops braminus* (Daudin, 1803) was added to this fauna (Baha El Din, 1996). In this note evidence is presented for the inclusion of *Coluber algirus* (Jan, 1863) to the snake fauna of Egypt. A single example of this species (SMB 10600 in private collection) was collected by the author south-west of Marsa Matruh, Egypt, at 31°19' N 27° 05' E, on 19 December 1999.

DESCRIPTION

Sub-adult female, SVL 65 cm, tail 15 cm. General colour brownish with about 90 alternating dark and light marks along the entire dorsal side, coalescing into a narrow dark line above the tail. Anterior dorsal side of head grey brown with a wide black band on nape (see Fig. 1). Venter cream coloured. There are regular dark blotches on the margin of, approximately, every third or fourth ventral. Supralabials 9/8 with fifth entering orbit, infralabials 9/9, ventrals 224, subcaudals 96, dorsal scale rows at mid-body 25, anal undivided.

RESULTS AND DISCUSSION

The specimen is referred to *Coluber algirus*. The only other *Coluber* species known from the Marsa Matruh region with which this species could potentially be confused is *C. rogersi* (Anderson,

Fig. 1. *Coluber algirus* from south-west of Marsa Matruh, Egypt (SMB 10600). Photo by author.

1896). However, *C rogersi* differs in having only 17-19 dorsal scale rows at mid-body. Colour and pattern also differ significantly. The general colour is greyish, with dorsal banding pattern restricted to the anterior two-thirds of the body length and lacking the black band on the nape.

Coluber algirus is distributed from Mauritania eastwards through Morocco, Algeria, Tunisia, Libya, and Malta, where it is possibly introduced (Arnold & Burton, 1978; Schätti, 1986; Schleich et al., 1996). The present record extends the range of the species more than 300 km further east of its easternmost known distribution limits at Tobruq, Libya (Krammer & Schnurrenberger, 1963) and is the first from Egypt. Resetar (1981) and Schleich (1987) both recorded the species from Kouf National Park in northern Cyrenaica, Libya, not very far from Egyptian territory.

The specimen was found at noon amongst rubble of an old ruin situated atop of a limestone ridge. The same building had several *Tarentola mauritanica fascicularis* geckos on its walls, which would seem to be the snake's main prey item in this region. Indeed, the snake consumed one of these lizards in captivity. The species is probably rare, with a limited distribution extending in a narrow band along coastal ridges that fringe the western Mediterranean coast of Egypt, perhaps extending further east to Alexandria. Its sympatric congener *C. rogersi*, which is an uncommon but widespread inhabitant of the region, seems to prefer more open and flat rock-strewn terrain. Six other snakes belonging to the genus *Coluber* are currently known from Egypt: *florulentus* Geoffroy, 1827, *jugularis* Linnaeus, 1758, *nummifer* Reuss, 1834, *rhodorhachis* (Jan, 1865), and *sinai* (Schmidt & Marx, 1956).

ACKNOWLDEGEMENTS

The specimen of *Coluber algirus* was obtained during fieldwork carried out for the Nature Conservation Sector of the Egyptian Environmental Affairs Agency. I would like to thank Dr. Francis Gilbert for reviewing a draft of this note. Special thanks are also due to my wife, Mindy, for her support and encouragement.

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DO JUVENILE SLOW-WORMS LIVING UNDER A REFUGE INTERACT WITH ONE ANOTHER?

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It is well-known and well-documented that Slow-Worms *(Anguis fragilis)* spend part of their time beneath flat objects on the surface of the ground. These may include stones, pieces of wood, and pieces of sheet or corrugated metal. Part of the reason is that individuals may increase their body temperature by conduction, as a result of solar infra-red radiation heating the upper surface (e.g. Barker & Hobson, 1996; Gaywood & Spellerberg, 1996; Reading, 1996, 1997; Riddell, 1996; Platenberg, 1999). It is equally well-known, but less well-documented, that individual Slow-Worms appear to vary enormously with respect to the frequency, duration and constancy of this behaviour (e.g. Platenberg, 1999). Most people who have studied Slow-Worms regard them as highly unpredictable animals - one of the authors of this paper sometimes calls them "chaotic" (in the rather precise way in which a physicist would use this term).

Observations were made in 1999 on a population of Slow-Worms in an allotment in Bristol. Some of the individuals in this population could be recognised from close-up photographs. This technique was first used for identifying slow-worms by Smith (1990) and was developed by Platenberg (1999). This note records the presence of three individually-recognisable juveniles (i.e. animals which would have been born in 1998) underneath a plastic fertiliser sack measuring 40 x 40 cm between 28 May and 16 June 1999. This was present on the allotment before observations began. The sack was turned over, and the presence or absence of the three recognisable Slow-Worms recorded by photographing all the lizards present, on 24 occasions between 11.00 a.m. and 20.00 p.m. during this period. Other work on the same allotment had shown that repeatedly examining a refuge by overturning (and then replacing) it does not inhibit the Slow-Worms using it provided that they are not handled, because the frequency of observation of marked individuals did not decrease with time (Lowson, 1999). The record for the three individuals is shown in Figure 1.

The first thing to notice about these data is that none of the juveniles was present on all occasions. The pattern of presence or absence appeared to be random. This was tested rigorously, using simple probability calculations.

Juvenile 1 was present on 14/24 sampling occasions. The sequence of times present looks random, but the sample size is too small to test this using the Poisson series. Juvenile 2 was present on 6/24 occasions. If the presence of both individuals was a random variable, i.e. one did not influence the other, and neither was influenced equally by external factors, then both should have been present together on 0.58 x 0.25 = 0.15 of sampling occasions, which is 3.6 samples. The observed figure was 4 samples. Similar reasoning can be used to calculate the probabilities of finding individuals 1 and 3, 2 and 3, and 1, 2 and 3 together. The results are shown in Table 1. In all cases – bearing in mind that the observed values can only be integer – the observed and expected values show exact agreement.

Combination	Observed	Expected
1 and 2	4	3.6
1 and 3	5	5.3
2 and 3	2	2.3
1, 2 and 3	1	1.3

Table 1. Observed and expected number of occasions (N=24) when different combinations of three individual juvenile Slow-Worms were found under a plastic fertiliser sack.

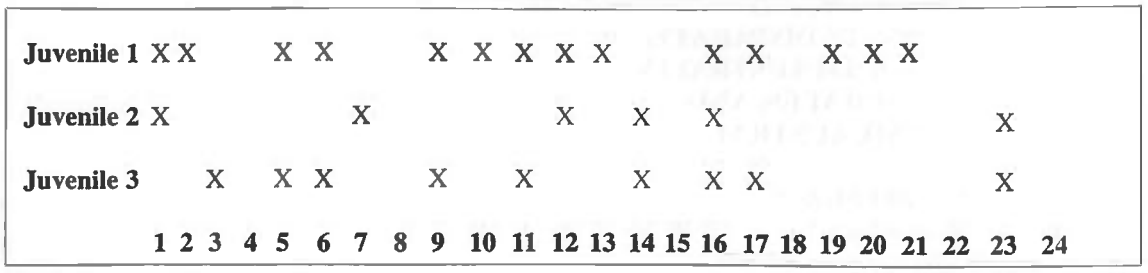

Fig. 1. Presence (X) or absence (no symbol) of three juvenile Slow-Worms under the plastic sack on 24 sampling occasions.

The picture of Slow-Worm activity which is emerging – although it is a hazy one – is that individuals spend much time foraging in soil, leaf litter and elsewhere, but may occupy refuges beneath stones and other objects from time to time (see references in the first paragraph). The data presented here provide circumstantial evidence that individual interactions, whether positive or negative, do not influence this behaviour. This is just a "snapshot" of one aspect of the behaviour of Slow-Worms. So little is known about these elusive animals, however, that we thought it was worth recording.

ACKNOWLEDGEMENTS

Thanks are due to Bristol City Council Leisure Services Department for permission to work in the allotment. The field work was carried out by GL in partial fulfilment of the requirements for the degree of MSc in Conservation and Management of the Natural Environment at Bristol University.

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HERPETOFAUNAL OBSERVATIONS IN DISPARATE HABITATS IN SOUTH AUSTRALIA, NEW SOUTH WALES, AND QUEENSLAND, AUSTRALIA

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INTRODUCTION

An engaging challenge of Australian herpetology is the ratio of reptiles and amphibians to scientists - in the face of numerous taxonomic problems, there are relatively few scientists to resolve them. Keogh and Smith (1996:697) commented that 'while other areas of the world which have relatively fewer taxa and many more workers (i.e., North America and Europe) have resolved many-species-level problems, Australia is still a virtual frontier of taxonomic research'. This sentiment, combined with the fact that Australia is home to more species of reptiles (ca. 765 species) and amphibians (ca. 210 species) than any other country in the world, makes the prospect of discovering undescribed species probable (Barker et al., 1995; Morell, 1999).

I explored three climatically and vegetatively diverse habitats (semi-arid chenopod shrubland, open-forest, and tropical rainforest) in the autumn of 1998 (Figs. 1-4). From 31 Aug - 12 Dec of that year, I participated in a field study at the 'Winters' Field Station approximately 150 km NNE of Adelaide, South Australia (Fig. 2). The research was conducted under the auspices of Prof. C. M. Bull of the Flinders University of South Australia. The purpose of the research was to add data to ongoing studies of the behaviour and ecology of the Shingleback Skink (*Tiliqua rugosa* - see Bull et al., 1993; Bull & Baghurst, 1998; Bull & Freake, 1999; Bull & Pamula, 1998). Between 5 and 8 Nov 1998 I explored the environs of Lake George, New South Wales (Fig. 3), and subsequently (18-26 Dec 1998) made herpetofaunal observations in the rainforests of Cow Bay, Queensland (Fig.4).

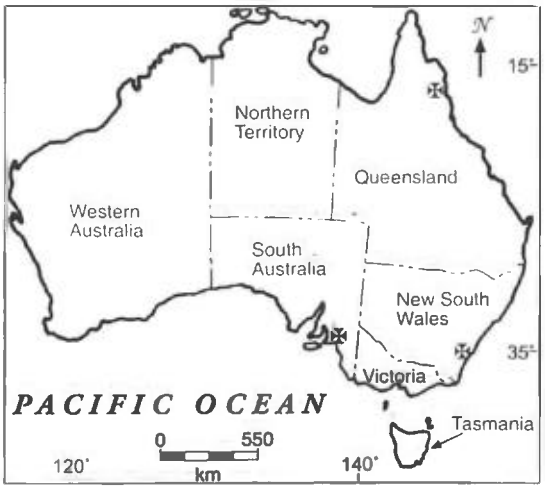


Fig. 1. Map of Australia. Symbols represent observation sites in South Australia, New South Wales, and Queensland.

MATERIALS AND METHODS

All the species listed below were identified using keys, photographs and descriptions noted in Barker et al. (1995), Cogger (1992), and Mirtschin & Davis (1992). I recommend all three books to anyone interested in conducting herpetofaunal observations in Australia, as well as Shine (1993) for an excellent discussion of the biology of snakes.

In South Australia, observations typically were made by conducting visual surveys, either on foot or road cruising by car. Some species were observed under refugia such as tin sheets and dead sheep carcasses. All observations were conducted during the day between 0900 and 1900 hours because temperatures usually were too low at night for herpetofaunal activity. On 28 Nov 1998, a drift fence (T-shaped, ca. 10 m long) with 2 pitfall traps (ca. 45 cm deep) was constructed in an area dominated by bluebush and left in place until 12 Dec 1998 in order to detect species that had been missed by the visual survey method (Greenbaum,1999). Observations in New South Wales were conducted by visual survey or checking under sheets of tin that littered the ground. In Queensland, observations were made

by visual surveys by day and night. To minimize disturbance to nocturnal rainforest species, photographs were used to confirm identification.

SOUTH AUSTRALIA

The 'Winters' Field Site is located near Mt. Mary, South Australia (34°06' S, 139°26' E; Fig. 2), east of the Flinders ranges (Main & Bull, 1996). Characteristically, the summers are dry and hot and the winters cool and wet; mean annual precipitation is 270 mm (Bureau of Meteorology, 1975). During my visit, temperatures ranged from near freezing (1°C) at night to very hot (42°C) at midday. The area had been extensively cleared for sheep grazing; resulting vegetation damage and sheep scat (with accompanying bushflies) were ubiquitous (Kirkpatrick, 1994). Wilson (1990) noted that more than 60% of Australia's land surface is utilized for grazing, which results in habitat destruction and disruption of the natural ecosystem. The dominant vegetation of the area includes mallee eucalyptus trees (*Eucalyptus sp.*), bluebush (*Maireana sp.*), saltbush (*Atriplex sp.*), and spear grass (*Stipa sp.)* (Leigh, 1994). Bluebush has a high salt content and succulent leaves, and is resistant to fire; no bushfires were reported in the area during the field season.

Both western grey kangaroos (*Macropus fuliginosus*) and red kangaroos (*Macropus rufus*) were seen daily, although competition from sheep grazing has been known to markedly reduce kangaroo populations in some areas of Australia (Bayliss, 1987). Feral cats (*Felis catus)* were spotted on occasion, as well as the more frequently sighted feral foxes (*Vulpes vulpes*); both are noted predators of amphibians, reptiles, birds, and lambs (Rolls, 1969; Macdonald, 1984). The field station itself is a 120-year-old house built by the Winters family, and was constructed from a stone frame, rock walls and a tin roof.

Old pieces of tin littered the terrain in several areas and served as ideal refugia for many species of reptiles and frogs, including Eyrean Earless Dragons, *Tympanocryptis tetraporophora* (which was not detected in areas lacking tin refuges). The

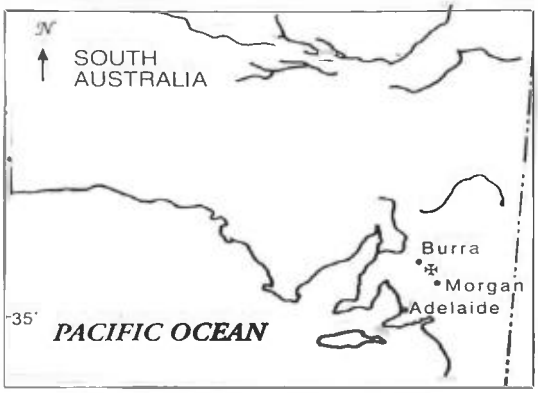


Fig. 2. Map of Australia showing the location of the Winters Field Station NNE of Adelaide, SA.

pitfall method of survey (Greenbaum, 1999) yielded 2 individuals of a skink (*Ctenotus uber*) that was undetected elsewhere and one unidentified species of scorpion. Baker (1986) reported catching one species of scorpion (*Urodacus manicatus*), as well as five species of lizards with pitfall traps in a similar habitat of South Australia. Reptiles and amphibians have been collected in pitfall traps in other studies in South Australia as well (Goonan et al., 1993; Read, 1995). Friend et al. (1989) and Greenberg et al. (1994) discussed the influence of trap design on diversity and numbers of species captured.

Two species of snake were previously reported at Winters in the past 50 years from anecdotal accounts. A 2.5-m carpet python (*Morelia spilota*), reported to have eaten several rabbits, was captured by a local landowner many years ago. In another account, a death adder (*Acanthophis sp.*) was described to have been sheltering under a felled eucalyptus tree. In the 14-year history of the Winters *Tiliqua* study, neither species has been sighted. Jason Ferris and Blaise Barrette reported species of reptiles at Winters in 1992-3 that I did not observe in 1998. They are as follows: Gekkonidae: Bynoe's Gecko (*Heteronotia binoei*); Agamidae: Painted Dragon (*Ctenophorus pictus*), Bearded Dragon (*Pogona barbata*), Five-lined Earless Dragon (*Tympanocryptis lineata*);

Scincidae: *Cryptoblepharus plagiocephalus, Lerista muelleri, Menetia greyii, Morethia adelaidensis, Morethia boulengeri; Typhlopidae: Ramphotyphlops* sp.; Elapidae: Western Brown Snake (*Pseudonaja nuchalis*), *Suta nigriceps, S. spectabilis*. I did not directly observe these taxa in the field or confirm species identification; they are omitted from Table 1.

SPECIES ACCOUNTS

Myobatrachidae

Limnodynastes tasmaniensis Günther, 1858; Spotted Grass Frog

3 records. 12 Sept 1998 - One adult observed under a sheet of tin during a light rain.

One adult observed under a flat rock situated beneath a frequently used water tank.

One adult heard calling in a cistern adjacent to the Winters house on several occasions throughout the field season.

Agamidae

Pogona vitticeps (Ahl, 1926); Central Bearded Dragon

Multiple records (>10). 1 Sept 1998 - One adult seen basking in road, another adult seen basking on a fence post. 12 Sept 1998 - One adult basking on ground adjacent to a bluebush. One juvenile found under a sheet of tin. This species was most common on warm, sunny days.

Tympanocryptis tetraporophora Lucas and Frost, 1895; Eyrean Earless Dragon

2 records. 9 Sept 1998 - One adult found sheltering under tin in an area of bluebush. A second individual was photographed under a piece of tin in November. The Winters locality is ca. 50 km southeast of the currently known range limit of this species (Cogger, 1992; Houston, 1998). Cogger (1992) noted that the status of this species is uncertain; it resembles *T. lineata*, which has been collected in past years at the Winters locality. The two species differ slightly in stripe pattern; *T. tetraporophora* possesses two preanal pores and two femoral pores (Houston, 1998).

Gekkonidae

Gehyra variegata (Duméril and Bibron, 1836); Tree Dtella

6 records. 3 Sept 1998 - One adult seen outside kitchen window at night, feeding on moths attracted to light at the window. 29 Oct 1998 - Two adult males fell from rafters in the ceiling of the house to the floor. One male was grasping the other's head in his mouth. Two other adults seen in an abandoned outhouse, ca. 20 m from the house; one juvenile seen in the house.

Scincidae

Cryptoblepharus virgatus (Garman, 1901); Cream-striped Shining Skink

10 records. 1 Sept 1998 - Several adults seen crawling among the cracks of the house. This species was observed on warm, sunny days thoughout the field season.

Ctenotus uber Storr, 1969

2 records. 29 Nov 1998 - One adult caught in pitfall trap. 30 Nov 1998 - One adult caught in pitfall trap. This species probably had escaped detection from visual surveys because of its speed, alertness, and tendency to seek shelter near chenopod shrubs.

Eremiascincus richardsonii (Gray, 1845); Broad-banded Sand Swimmer

3 records. 11 Sept 1998 - One adult seen foraging on the floor of the kitchen inside the house; when picked up, the lizard tried to bite. The lizard was noted shortly after a light rain began. 29 Nov 1998 - Two adults seen foraging on the floor of the house.

Lerista punctatovittata (Günther, 1867)

1 record. 10 Sept 1998 - One adult caught under a piece of tin during a light rain. The individual immediately lost its tail which continued to wiggle for several minutes.

Tiliqua occipitalis (Peters, 1863); Western Blue-tongued Skink
2 records. 3 Oct 1998 - One adult seen under a chenopod bush in the afternoon. When disturbed, the lizard opened its mouth and repeatedly projected its bluish tongue. Another individual was observed crossing a road in November.

Tiliqua scincoides (White, ex Shaw, 1790); Eastern or Common Blue-tongued Skink
1 record. 26 Nov 1998 - One adult seen crossing a road on a warm afternoon. The animal did not try to bite when disturbed.

Juvenile Shingleback skink, *Tiliqua rugosa*, ca. 15 cm long. Photo by author.

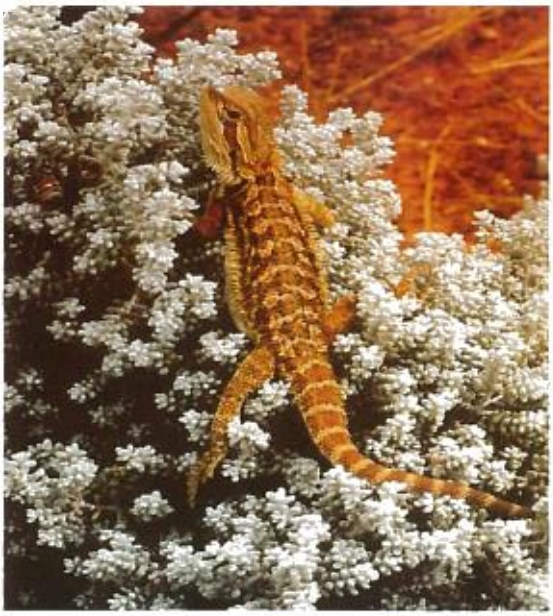
Tiliqua rugosa Gray, 1825; Shingleback Skink or Sleepy Lizard
Multiple records (>1000). More than 50 adult lizards with radio transmitters were tracked twice a day. Lizards were also observed by road cruising in the general vicinity of Winters. This species was the most common reptile at Winters. 17 Oct 1998 - Hottest day of season (42°C); most lizards with radio-transmitters could not be found above ground. Two adults were observed entering a rabbit burrow. 22 Oct 1998 - Collected 72 adult lizards in one day, breaking a 14-year-old record for the study. 28 Oct 1998 - Collected 73 adult lizards in one day. 29 Oct 1998 - Collected a juvenile lizard 18 cm long and 150 g in weight; juveniles rarely were seen throughout the field season. 4 Nov 1998 - Unusually humid; caught 82 adult lizards in one day (current record for the study). 17 Nov 1998 - An adult was observed walking in an area with many bluebushes and carrying a young bird in its mouth.

Varanidae
Varanus gouldii (Gray, 1838); Sand Goanna
7 records. 5 Oct 1998 - One adult seen crossing road. 15 Oct 1998 - Two adults seen fighting in the entrance to a rabbit burrow; only their heads could be seen outside of the burrow. 22 Oct 1998 - One large adult seen basking in the road. When disturbed the lizard rapidly ran up a tree. 30 Oct 1998 - Two adults seen fighting in a bipedal posture about 2 m from the rabbit burrow noted above. The fight lasted an hour, at which time one lizard ran into the burrow. The other lizard did not move for another 5 minutes. It retreated into a separate burrow leading into the same underground system. 17 Nov 1998 - Startled an adult basking near the road. It quickly ran off into a chenopod shrub. These lizards were observed on very warm days; no juveniles were seen. Thompson *et al.* (1992) first described the fighting behaviour of this species.

Elapidae
Pseudonaja textilis (Duméril, Bibron and Duméril, 1854); Eastern Brown Snake
33 records. 9 Sept 1998 - One juvenile seen under a sheet of tin. 10 Sept 1998 - One adult about 1 m total length (TL) photographed on the road; the snake was not disturbed by our car, but spread its hood and moved away when approached. 11 Sept

A pair of male Sand Goannas, *Varanus gouldii*, fighting over the rights to a large system of rabbit burrows.
Photos by author.

Giant tree frog, *Litoria infrafrenata.*



Subadult Central bearded dragon, *Pogona vitticeps*, on a bluebush. With the onset of maturity, the pattern observed in this specimen will fade to a uniform black or brown.

1998 - One adult seen emerging from a rabbit burrow. 18 Sept 1998 - One adult seen moving in open grassland. 30 Sept 1998 - One adult found dead on road (DOR); another adult was seen moving along the roadside 20 m from the DOR specimen. A large adult (ca. 1.5 m) seen moving in grass adjacent to another road. 5 Oct 1998 - One subadult seen near bluebush on a cool morning at 0900 hours. 9 Oct 1998 - One adult seen regurgitating a bird. 15 Oct 1998 - One subadult seen emerging from the same system of rabbit burrows that two sand goannas had been observed entering minutes before. 29 Nov 1998 - One large adult (ca. 1.25 m) seen trying to find an entrance to the Winters house. Most snakes were seen on warm, sunny days. If disturbed, most individuals fled; some raised their heads in an 'S' shaped loop and lunged at the aggressor.

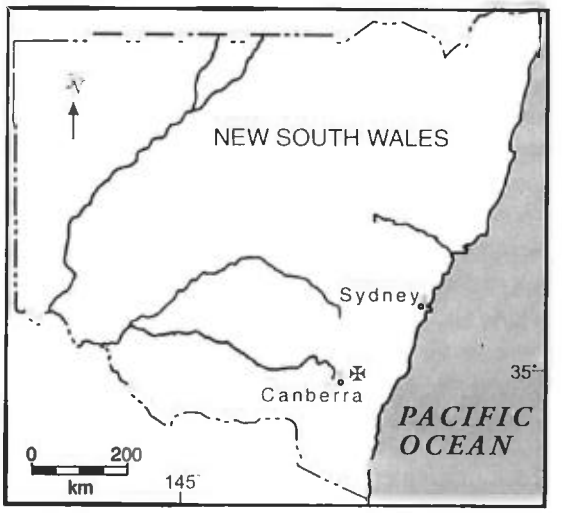


Fig. 3. Map of New South Wales showing the location of the observation site at Lake George.

NEW SOUTH WALES

On 8 Nov 1998 I explored a habitat of open-forest (sclerophyll forest) about 1 km east of Lake George in New South Wales (Fig. 3). Open-forest habitat is defined as a community that has 30-70% canopy cover (Gill, 1994). Just northeast of Canberra, ACT, the habitat is dominated by *Eucalyptus* trees and understory shrubs, herbs, ferns, and grasses. The site is west of a road in an area bordered by two flowing streams. Cheney (1976) classified open-forest habitat as one of the most severe fire risks in Australia; it is common for these ecosystems to experience significant fires every 3 -5 years.

Together with similar habitats in Tasmania, open-forests represent one of the most important refuge sites for animals in Australia; their future is threatened by root rotting disease (*Phytophthora*) and bauxite mining (Gill, 1994). Annual temperatures range from close to freezing (2°) to warm (30°C), and the area receives over 600 mm of rainfall per year (Bureau of Meteorology, 1975).

SPECIES ACCOUNTS

Scincidae

Egernia cunninghami (Gray, 1832); Cunningham's Skink

6 records. Six adults caught under several sheets of tin and a pile of wooden fenceposts in an area of unshaded grass. Several other adults were seen but not captured.

Hemiergis decresiensis (Cuvier, 1829)

1 record. One adult caught underneath a log in an area of grassland shaded by trees.

Elapidae

Pseudonaja textilis (Duméril, Bibron and Duméril, 1854); Eastern Brown Snake

1 record. One adult seen basking adjacent to a pile of wooden fenceposts; the snake retreated into the woodpile when discovered.

QUEENSLAND

The Daintree Rainforest of Queensland's far north has an ancient history of 120 million years, and has recovered from catastrophes ranging from volcanic eruptions to chilling Ice Age winds (Nielsen, 1997). A recent addition to the World Heritage listing, the Daintree is completely protected from logging in an area stretching from Cooktown to Townsville (ca. 9000 square kilometers), and represents the largest continuous area of rainforest in Australia (Adam, 1992).

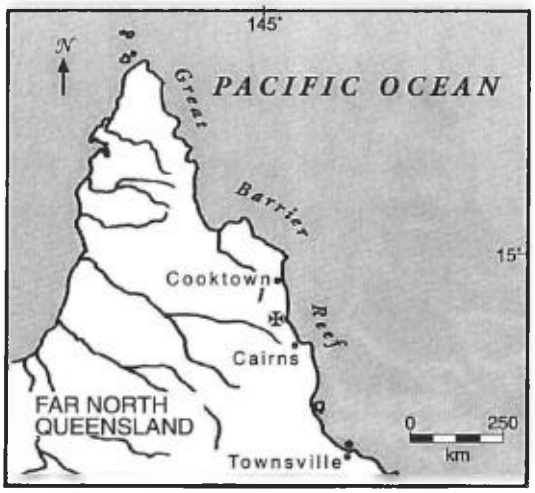


Fig. 4 Map of northern Queensland showing location of the observation site at Cow Bay.

Rainfall ranges between 2-4 m per year (Bureau of Meteorology, 1975). The habitat at the site I explored near Cow Bay, Queensland (Fig. 4), is classified as 'very wet', and receives the highest amount of rainfall of any coastal rainforest area between Cairns and Cooktown (Tracey, 1982). Observations were conducted from 20-26 Dec 1998, during the hot, stormy season just before the wettest time of the year. Annual temperature averages between 26 and 31°C (Bureau of Meteorology, 1956).

Webb & Tracey (1994) characterized the structure of the forest as 'complex mesophyll vine forest', with medium to high levels of soil nutrients. Tracey (1982:14) considered the tract of forest at Cow Bay to be the most complex rainforest structure in Australia (Type 1a) and 'represents the optimum development of rainforest in Australia under the most favourable conditions of climate and soil on the tropical humid lowlands'. Dominant forms of vegetation include palms, cycads, ferns, lianas, and hundreds of species of buttressed trees. Kirkpatrick (1994) noted that rainforest habitats often do not recover after severe fire damage, but the frequency of fires is either low or non-existent, because some rainforest vegetation will not burn. Uprooting damage by feral pigs (*Sus scrofa*) was ubiquitous and may represent a direct threat to the herpetofauna of the region because the introduced mammals are known to prey on small vertebrates (Macdonald, 1984). Several species of treefrogs and skinks could not be identified to the species level with absolute certainty, and are not included in the accounts below.

SPECIES ACCOUNTS

Bufonidae

Bufo marinus (Linnaeus, 1758); Cane Toad

1 record. 21 Dec 1998 - One adult observed motionless adjacent to path on ground at night. Introduced to Australia in 1935 with the intention of controlling cane beetles, the amphibian is considered a pest. The toad will eat many species of reptiles and amphibians, and poisons any animals that prey upon it. The range of this species is spreading west and south to the Northern Territory and New South Wales, respectively (Cogger, 1992; Johnson, 1992).

Hylidae

Litoria gracilenta (Peters, 1869); Daintry Green Tree Frog

1 record. 21 Dec 1998 - One adult observed about 1.5 m from the forest floor, perched on a leaf at night.

Litoria infrafrenata (Günther, 1867); Green Tree Frog

1 record. 23 Dec 1998 - One adult observed about 0.5 m from the forest floor, perched on a liana at night.

Chelidae

Elseya latisternum Gray, 1867; Saw-shelled Turtle

5 records. 21 Dec 1998 - Three adults and two subadults observed in a stream flowing through forest without any penetrating rays of sunlight. All submerged once alerted to my presence. Afternoon.

Agamidae

Hypsilurus boydii (Macleay, 1884); Boyd's Forest Dragon

Multiple observations (>10). 21 Dec 1998 - One adult perched at eye-level on a liana. When disturbed, the lizard dropped to the ground and retreated by running bipedally. Afternoon. 23 Dec 1998 - One adult perched on a liana adjacent to a frequently used cabin; the animal remained motionless and was not noticed by more than a dozen people walking < 2 m away. Afternoon. This species was quite common at Cow Bay, although Cogger (1992) illustrated a very limited range within Queensland. While sleeping at night, the lizards tended to be perched higher if there was obvious disturbance by feral pigs on the ground below. This was an adaptation to avoid predation by the feral mammals.

Gekkonidae

Heteronotia binoei (Gray, 1845); Bynoe's Gecko
1 record. 22 Dec 1998 - One subadult observed under a hollow log at midday.

Scincidae

Carlia rubrigularis Ingram and Covacevich, 1989
Multiple observations (>10). 21 Dec 1998 - Numerous adults observed running across the forest floor during the day.

Boidae

Morelia amethistina (Schneider, 1801); Amethystine Python
2 records. 21 Dec 1998 - One subadult (ca. 1 m) was observed crawling on the forest floor at night, an hour later an adult (ca. 3 m) observed at base of a tree. When disturbed, the snake climbed up the tree out of reach in seconds.

Colubridae

Stegonotus cucullatus (Duméril, Bibron and Duméril, 1854); Slatey-grey Snake
1 record. 21 Dec 1998 - One adult observed foraging on the forest floor at night.

DISCUSSION

The amount of time spent making herpetofaunal observations in the three habitats differed by orders of magnitude, a signficant amount of diversity was found at each site. Da Silva and Sites (1995) noted that rare species in the New World tropics often are discovered randomly and one is more likely to find a given species as more time is spent in a given area. This observation is reflected in the number of species discovered at each site relative to the time spent searching. Despite the fact that the South Australian site was thoroughly explored for three and a half months, 13 of the 22 species reported by Ferris and Barrette (1992-3 field season at Winters) were never seen. It is possible that some of their identifications were erroneous (e.g., *Tympanocryptis lineata* and *Cryptoblepharus plagiocephalus* may be correctly attributed to *T. tetraporophora* and *C. virgatus*, respectively), or that environmental conditions in 1998 mitigated against the observation of certain taxa. However, two species (*Lerista punctatovittata* and *Tiliqua scincoides*) were observed on one occasion each in 1998, and would have been missed had I not been in the right place at the right time.

One can imagine that the diversity of species missed at the other two sites was because of the dearth of search time. My original purpose in traveling to Lake George was to observe Eastern Tiger Snakes (*Notechis scutatus*), which were supposedly common in the area; however, none were found. These observations should serve as a caveat to workers conducting biodiversity inventories in Australia or elsewhere. No matter how thorough a search may be in a given area, at a given time, the presence of certain species will invariably be missed. To maximize the effectiveness of herpetofaunal surveys, many collecting methods should be employed, and observations should be conducted in different years, times of year, microhabitats, times of day, weather conditions, and levels of anthropogenic environmental disturbance. For example, a recently-described frog (*Eleutherodactylus coffeus*) was found in the ground cover leaves of a coffee grove, and to date, has not been discovered in any other type of habitat (McCranie & Köhler, 1999).

Table 1. Summary of all species of reptiles and amphibians encountererd. 'X' indicates location(s) where found.

Species	South Australia	New South Wales	Queensland
Bufonidae			
Bufo marinus			X
Hylidae			
Litoria gracilenta			X
L. infrafrenata			X
Myobatrachidae			
Lymnodynastes tasmaniensis	X		
Chelidae			
Elseya latisternum			X
Agamidae			X
Hypsilurus boydii			
Pogona vitticeps	X		
Tympanocryptis tetraporophora	X		
Gekkonidae			
Gehyra variegata	X		
Heteronotia binoei			X
Scincidae			
Carlia rubrigularis			X
Cryptoblepharus virgatus	X		
Ctenotus uber	X		
Egernia cunninghami		X	
Eremiascincus richardsonii	X		
Hemiergis decresiensis		X	
Lerista punctatovittata	X		
Tiliqua occipitalis	X		
T. scincoides	X		
T. rugosa	X		
Varanidae			
Varanus gouldii	X		
Boidae			
Morelia amethistina			X
Colubridae			
Stegonotus cucullatus			X
Elapidae			
Pseudonaja textilis	X	X	

The observations discussed in this paper are not meant to reflect the efforts of an exhaustive biodiversity survey by any means. However, they can bolster future efforts to document all species of reptiles and frogs known to occur in these areas of Australia. The most noteworthy of my observations include a range extension for the Eyrean Earless Dragon *(Tympanocryptis tetraporophora)*.

Because the few professional herpetologists in Australia cannot conduct such surveys in all areas of interest, it is hoped that amateurs will become interested in the diversity of animals in their vicinity and use the field guides mentioned herein

to make identifications. Basic data on distribution can be improved through such efforts, as well as information on behaviour, ecology, and other aspects of biology which may be of use to future workers. Although detailed field notes are the most desirable and useful pieces of information to professional herpetologists, even the most inexperienced novice can add to the growing body of knowledge by recording precise locality data and taking photographs to serve as a proxy for vouchered specimens.

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THE DURRELL WILDLIFE CONSERVATION TRUST AND THE MALLORCAN MIDWIFE TOAD, *ALYTES MULETENSIS* - INTO THE 21ST CENTURY

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ABSTRACT

The Mallorcan Midwife Toad recovery programme is one of The Durrell Wildlife Conservation Trust's most long standing and successful conservation projects. Combining captive-breeding, re-introduction, *in-situ* and *ex-situ* research and a diverse educational programme, this integrated approach has helped secure the immediate future of this critically endangered (IUCN, 1996) amphibian.

A project grant received in 1999, from the Captive-Breeding Committee of the British Herpetological Society, has helped fund new facilities in the Herpetology Department of Jersey Zoo, and financed important and pioneering health screening work on wild populations of midwife toads.

This short report describes the work carried out as a consequence of this grant, and some of the results achieved so far.

INTRODUCTION

It is still less than 20 years ago, that the fossil Discoglossid amphibian, the Mallorcan Midwife Toad *Alytes (Balephryne) muletensis*, was discovered alive and breeding (albeit in perilously low numbers), in the deep gorges of the Balearic island's remote northern mountain range - the Sierra de Tramuntana.

Once believed to be widespread throughout Mallorca, the midwife toad, or Ferreret, was extirpated from almost the entire island - not this time by the environmentally catastrophic demands of the invading package deal tourist - but by the more subtle, yet no less devastating invasion of predator and competitor species such as the viperine snake *Natrix maura*, and the Green Frog *Rana perezi*.

The Durrell Wildlife Conservation Trust (then the Jersey Wildlife Preservation Trust), first became involved with the species and its plight in 1985 when, at the request of the Mallorcan Government, toads were brought to Jersey Zoo, to form the nucleus of a captive breeding programme (Tonge, 1986). One of the primary aims of this programme was to generate captive-bred toads and tadpoles for re-introduction to the wild. The first re-introductions were carried out in 1989, and have occurred on almost an annual basis ever since.

Toads are now held and bred at a number of other European institutions including; Barcelona Zoo, The Durrell Institute of Conservation and Ecology at the University of Kent, Marineland (Palma de Mallorca), The Open University, Stuttgart Museum and, The Wildfowl and Wetlands Trust.

The success of the recovery programme, now in its fifteenth year, is probably best demonstrated by the following facts:

1] 25% of the current wild population in Mallorca now originates from captive-bred toads.
2] The distribution of the toad has increased by 100% since the instigation of the recovery programme. From its estimated range of only 100km² in the early 1980's, the species is now believed to occupy a range in the region of 200km²
3] Twelve new breeding sites have been established since 1989 through re-introductions of captive-bred toads. This compares with an estimated thirteen original wild sites.

HEALTH SCREENING OF WILD MALLORCAN MIDWIFE TOADS

Previous work on the parasite loads of this species, carried out at both Jersey Zoo and Barcelona Zoo, have focused entirely on those animals kept in captivity (Roca et al, 1998). Analysis of wild toad populations would enable a comparative study on

Typical habitat of *Alytes muletensis*, Mallorca.
Photo by G. Garcia.

the endo-parasite fauna between captive and wild animals. Such a study will enable the health status of captive-bred toads to be more accurately assessed, and those destined for re-introduction to be more effectively screened. Furthermore, a comparison of endo-parasite loads between original wild toad sites and recent reintroduction sites may yield important information on how the parasite levels in released captive animals, may differ from those that have always lived in the wild.

During a field trip in July 1997 (Buley & Garcia, 1997), Mallorcan Government and Jersey Zoo staff collected faecal samples from wild toad populations in preparation for such a study. Samples from tadpoles were gathered at all of the wild toad breeding sites in Mallorca including original wild sites and historic reintroduction sites.

The collection of faecal material proved relatively straightforward. Groups of 5-20 tadpoles from an individual pool were placed in a plastic bottle filled with water for 10-15 minutes. After this time it was usually found that sufficient faecal material had been produced.

At least two samples were collected from each site. One sample was preserved in 10% formol saline, for specific identification of endo-parasitic species including protozoa, nematodes and coccidia and the second was preserved in a 2.5% solution of potassium dichromate to hatch any coccidial cysts to enable identification of the species.

A total of 103 samples were collected and stored in the laboratory at Jersey Zoo. The grant from the British Herpetological Society in 1999 meant that a qualified parasitologist could be employed to carry out the arduous analysis of these valuable samples.

Each of the 103 samples was analysed using a direct preparation method. A drop of the preserved

Table 1. Preliminary comparison of endoparasite types in wild and captive *A. muletensis*

Wild A. *muletensis*	**Captive** *A. muletensis* (from Roca *et al.*, 1998)
Helminths	Helminths
- Cestodes	- Nematodes
- Nematodes	
- Trematodes	
Protozoa	Protozoa
- Ciliophora (Ciliates)	- Ciliophora (Ciliates)
- Sporozoa (Coccidia)	- Sporozoa (Coccidia
- Sarcodina (Entamoeba)	

Cisterns at reintroduction site. Photo by G. Garcia.

Alytes muletensis. Reintroduced adult, 2nd February 1997. Photo by G. Garcia.

faecal sample solution was placed on a microscope slide, and a cover slip placed over it. Each slide was then screened in its entirety using a Nikon YS2-H binocular microscope under 10x magnification and any oocysts, protozoa, eggs or larvae were identified using 40x magnification. The abundance of each endo-parasite type was recorded for each preparation. Individual organisms were measured, using a graticule (Graticules Ltd. Tonbridge, Kent), and photographed using a Canon EOS 1000FN camera with the appropriate microscope attachment.

Veterinary pathologist Candelaria Gonzalez-Villavicencio examines Mallorcan Midwife Toad faecal samples for parasites.

Table 1 gives just a preliminary indication of the types of endoparasite found during the study and, on a very superficial level compare this with what was found in the study of captive animals at Barcelona Zoo and Jersey Zoo.

It would, at this stage, certainly be premature to attempt an interpretation of this very basic data. Endo-parasite levels in this investigation however, as with the captive work, show low, or very low prevalence in most samples screened, suggesting high endo-parasitic infection is not common in wild Mallorcan Midwife Toads. Some caution must be employed in any direct comparisons, as samples from the wild originated from the aquatic larval stage of the species life-cycle, whilst in the captive study faeces were taken from the terrestrial toads. It would be quite reasonable to expect that endo-parasite loads will change with a changing physiology, environment, and diet.

The full results and an analysis of the faecal screening work carried out will be published at a later date (Gonzalez, in prep.).

A RENEWED CAPTIVE-BREEDING EFFORT

In late 1996, at a meeting of the International Group for the Recovery of the Ferreret, it was decided that fresh breeding stock should be collected from the wild for the captive programme

Fig. 5. New adult *Alytes muletensis* breeding facilities at the Durrell Wildlife Conservation Trusts' Herpetology Department. Photo by K. Buley.

to ensure that as wide a genetic base as possible is represented in the captive colonies.

During the 1997 field trip, this new stock was collected from three different wild populations in isolated gorges across the species natural range, 25 tadpoles were collected from each site. Tadpoles were taken from sites which had not previously been used to provide captive stock.

These three populations would be maintained and bred separately - thus maintaining the integrity of the potentially genetically distinct groups (the tiny populations of toads cannot cross from gorge to gorge and have therefore been reproductively isolated for up to 2000 years).

The Midwife Toad breeding facilities at Jersey Zoo, which had served the programme well for almost fifteen years, were in need of expansion and upgrade, to accommodate adequately the three separate breeding groups (in the past, the room has only had to cope with the one group).

The husbandry, breeding and rearing of this species has always proved relatively simple and the associated equipment/housing required is similarly uncomplicated. Large, clear plastic, lidded tanks with gravel substrate, hides and a large water bowl, coupled with an irrigation system for simulated rainfall have, in the past, proved to be an effective set-up for breeding (Tonge & Bloxam, 1989).

The BHS funding for 1999 ensured that the appropriate breeding and rearing tanks could be purchased and an efficient, automated irrigation system installed. Construction of the new facilities was completed in March, and the young toads started producing eggs in late May. By the end of September a total of 40 clutches (433 eggs) had been laid by the three breeding groups - a clear testament to the suitability of the new captive facilities.

Tadpoles hatched this year have already started to metamorphose, and these first generation captive-bred animals will be used to establish further colonies of toads at a number of the involved European institutions - colonies which will then generate further captive-bred stock, ultimately destined for release into the wild.

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REPRODUCTIVE BEHAVIOUR OF THE SAND LIZARD, *LACERTA AGILIS*, IN SOUTH-EASTERN DORSET, WITH A NOTE ON HABITAT MANAGEMENT

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INTRODUCTION

These observations form part of a general long term herpetological study in the area described. The Sand Lizard, *Lacerta agilis*, in Britain is at the extreme north-western edge of its range. Here it is a rare species and considered endangered enough to warrant protection through both national and international legislation. South-east Dorset is recognised as the last remaining stronghold for the species, containing 90% of the United Kingdom population (Moutlon & Corbett, 1999). It is here in this region that the Sand Lizard can still often be described as locally abundant. Such areas are exemplified by optimum habitat conditions or *foci*. These foci are essentially areas of mature dry heath with plenty of exposed sand and typically with a south-facing aspect. Areas of exposed sand are an essential prerequisite for successful egg deposition. All observations by the author were undertaken in such high profile areas over a period of five years or more.

STUDY AREAS AND METHODS

Specifically, the study sites are all contained in the Wareham and Purbeck area of Dorset and as already stated are all considered to be first class habitats. These foci are typically areas of mature lowland heath forming a rich mosaic in conjunction with associated heathland plant species. Many of the sites have been maintained or improved by active habitat management. Some sites are situated on fairly level ground, some along shallow ditches or gullies, and others on steep slopes. Most have a southerly aspect and in total area the study areas embrace eight separate locations and all exhibit microhabitats well suited for the Sand Lizard. In fact, all six species of reptiles were present in good numbers throughout the study areas.

For the purposes of this particular study no lizards were actually handled; it was essentially an exercise of patient observation. The study was purposely female-biased and individual lizards were identified by photographing and recording dorso-lateral occuli markings. The general ground coloration also proved to be a valuable guide and this was seen to vary considerably even within local communities. Typically, ground colour can be virtually any shade of brown, yellowish, or light to dark grey.

The study areas were visited throughout the active period, April through to September, three or four times a week as weather permitted. From 1997 onward the study areas were visited more frequently during the later months specifically to record the occurrence of second layings and hatchings.

RESULTS AND DISCUSSION

It has been stated that the mating period for the Sand Lizard in England is at a peak in May, with egg laying occurring in late June and through July (Smith, 1951). Observations for this study have shown a peak egg-laying period for the middle of June. During 1999, for example, 70% of the study animals laid in the period between 9th and 18th June. This was not expected, for also in 1999 fighting males and mating pairs were observed between 28th April and 14th May, which represented approximately 60% of the total adult sand lizards regularly observed throughout the study areas.

During the study period observations were made where mating and egg-laying occurred simultaneously. This obviously involved separate individual females but was often seen to happen on the same day, and on three occasions within the same restricted egg-laying area. In one instance a female excavating a nest burrow was observed to become aggressive when disturbed by a mating pair. The female backed into the burrow with

mouth gaping. Nest burrow excavation only continued when the female appeared satisfied that the mating pair had gone. Over a five year period results show an overlap of mating and egg-laying of around 14 days. It is perhaps interesting to note, but by no means conclusive, that many of the late matings involved young females probably in their first breeding season.

The occurrence of second laying has become apparent in recent years and with regard to this study involves approximately 25% of the study animals. The peak period for second laying appears to be from the middle to late July. However, despite careful searches, no mating activity was observed in the weeks prior to second laying, and in addition most adult males were seen to have dispersed to feeding grounds some distance away. This suggests the possibility that female Sand Lizards are capable of storing sperm in the short term. The likelihood of sperm retention is perhaps enhanced when further considering that in addition to the actual location of adult males these are unlucky to be in prime breeding condition at this time. There are a number of Sand Lizard captive breeding projects in progress, some of which have exhibited second layings, and it is interesting to note that here also no late matings have been observed (M. Preston, pers. comm.). Sperm storage is known in other reptile groups (Gist & Jones, 1987; Luiselli, 1993).

Throughout the study period close attention was given to the actual behaviour of individual female Sand Lizards during the egg-laying period. At around the second week of June many females were seen in exposed places exploring possible nesting sites. During these occasions they appeared vulnerable and certainly allowed a close approach, often within a metre. With care it was possible to follow a female and observe the efforts of each exploratory digging. Some females were seen to engage in up to eight such trial digs, while others appeared less fussy and made a positive burrow after just one or two tries. In areas that exhibited natural bare areas of sand, females were seen to excavate within a metre of good cover. Even so, female Sand Lizards appear to be

Sand Lizard nest burrows, Purbeck, Dorset. Photo by author.

especially vulnerable when busy excavating the nest burrow. Although it may be close to cover, digging with the head down the burrow makes a good target for a predator. However, female Sand Lizards were seen not to be totally oblivious to danger. All the females observed while digging retreated from their burrows and had a good look around every ten seconds or so. During the egg-laying period female Sand Lizards were seen to be bold and aggressive, and the intensity of boldness varied between individuals. The most usual behaviour was that if a female was disturbed when digging it would scuttle off into cover but return in a couple of minutes, often much sooner. Some females, however, would not retreat but stand their ground and gape with body arched; others appeared to be quite oblivious and would simply carry on digging. When disturbed by a pony, one notable individual just stood its ground with mouth agape in defiance. The boldness of female Sand Lizards during egg-laying has been observed by others over the years (Munro, 1967; D. Bird, pers. comm.).

Observations were also made regarding the interaction between breeding female Sand Lizards. This was particularly apparent in the study areas with a high population density. Behaviour of female Sand Lizards toward each other was seen to

Sand Lizard, *Lacerta agilis*; female excavating nest burrow. Purbeck, Dorset. Photo by author.

Female excavating nest burrow. Purbeck, Dorset; May 2000. Photo by author.

Defensive behaviour of female near nest burrow. Purbeck, Dorset, 1999. Photo by author.

Female entering nest burrow. Purbeck, Dorset; May 2000. Photo by author.

Female laying eggs. Purbeck, Dorset, 1999. Photo by author.

Sand Lizard nest site after egg-laying. Purbeck, Dorset, 1999. Photo by author.

be inconsistent; some tolerated intruding females, even allowing them to excavate a nest burrow just a short distance from their own. On one occasion two females digging in the same patch of sand were observed to exchange burrows, each laying their eggs in the other's burrow. Other females were very territorial, chasing off intruders and even biting if the chance arose.

The total amount of time taken to excavate the burrow, lay the eggs, and then cover the nest, varied considerably. A number of factors were involved, not least the weather; if it was too hot or raining then the lizards would retreat into cover. Similarly, if disturbed too often this obviously had a disruptive effect. The nature of the substrate also seemed to be an important consideration; even though they were excavating with much enthusiasm, some lizards suddenly stopped and moved elsewhere. This was after all other exploratory efforts, and on examining such a burrow it would be found to have an obstruction in the form of a stone or root. On two of the study areas the lizards sometimes dig into clay spoil; this was hard work for the lizard but it was still successful and many Sand Lizards have been hatched from these sites. On good, loose, sandy soil, a female Sand Lizard can complete the whole task of excavating, egg-laying, and nest-covering in as little as thirty minutes, although the longest session recorded, in sand, was 2½ hours. In clay spoil, a total time of 3 hours is not unusual.

NOTES ON HABITAT MANAGEMENT

The habitat requirements and the relevant management strategies for the Sand Lizard in Britain are now well known and documented (Moulton & Corbett, 1999). Despite this information, more general management techniques which include grazing, burning, and mowing, are still being employed on foci to the detriment of the Sand Lizards and other reptiles. Grazing, for example, is more applicable to wet heath areas, but where stock is allowed to roam at will it causes serious erosion and presents a particular threat to egg-laying sites which eventually may become habitual thoroughfares for

Excavation at Sand Lizard management site, Wareham, Dorset. 1999. Photo by author.

ponies and cattle. It is appreciated that these general management policies have been implemented as a long term strategy for maintaining and restoring heathland. However, in areas where rare species foci have been confirmed it is necessary for management techniques to conform to guidelines as set out by specialist groups such as The Herpetological Conservation Trust. A positive part of Sand Lizard management is to create and maintain areas of expose sand; this complements any existing natural exposure and provides a boost for breeding potential and population expansion. Depending on topography, an area of focus should contain between 2 and 20% of bare sand.

There are a number of ways of creating sand patches. On steep slopes or areas without vehicular access 'turfing' is the only option. This involves removing turves with a spades to a depth where clean bare sand is exposed. These patches are typically 2 x 1 metre in size. When practical, sand is exposed by mechanical means and such excavations usually follow natural features such as banks and tracks in the form of strips.

Sand exposure is a management feature of several of the study areas and these have been monitored carefully since their creation. Although clearly successful, it is hard to define just how successful. The number of lizard sightings alone may not be enough until correlated with records

begun prior to active management (in prep.). Although there is no ideal size for a mechanically created sand patch it is thought that apart from such features as firebreak edges and sandy tracks, the creation of very large patches should be discouraged. On one study area sand patches have been created which measure about 9 x 3 metres. Observations here have shown that both male and females lizards move around these patches well away from cover. On three occasions nest excavation was seen to take place more than two metres away from cover. This also meant that the subsequent hatchlings would be particularly vulnerable. Other reptiles, particularly the snakes, were seen to lie out on the peripheries of such patches. Potential avian predators were also often seen around these patches and included Buzzard (*Buteo buteo*), Kestrel (*Falco tinnunculus*), Carrion Crow (*Corvus corone*), Magpie (*Pica pica*), and Pheasant (*Pasianus colchicus*).

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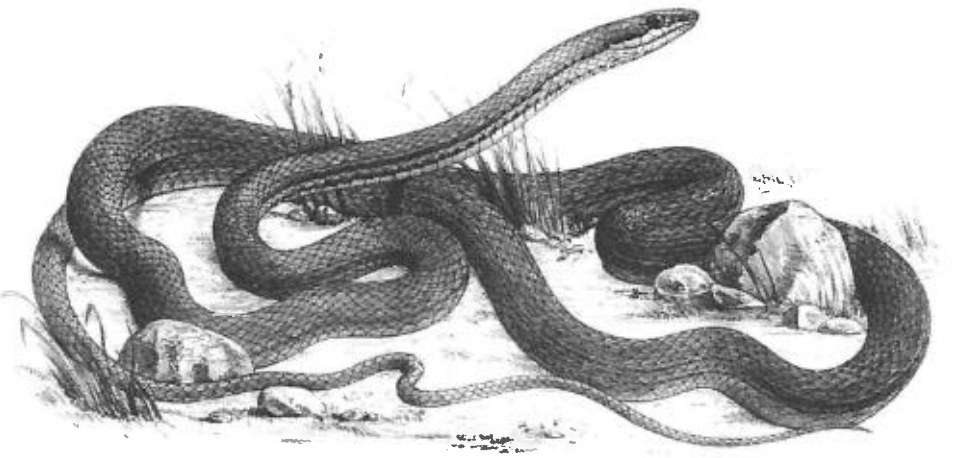

Sonoran Whipsnake (*Masticophis bilineatus*) from a lithographed plate in Biologia Centrali-Americana (Albert C.L.G. Günther, 1902). Reproduction courtesy of The Natural History Museum, London.

HERPETOFAUNAL EXPEDITION TO PARQUE NACIONAL PATUCA: A NEWLY ESTABLISHED PARK IN HONDURAS

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INTRODUCTION

This article presents the results of an expedition to survey the herpetofauna of a newly established Honduran national park, Parque Nacional Patuca (PNP). This 3750 km^2 park is located in east-central Honduras (Departamento de Olancho) and was officially established on 20 October 1999. Under the auspices of Fundación Patuca (an organization cooperating with Honduran and German non-governmental organizations concerned with conservation and sustainable development of the remaining forests in Central America) an expedition was undertaken to survey the amphibians and reptiles in a portion of the park. The east-central region of Honduras contains some of the largest tracts of primary forest remaining in Central America and has not been well explored previously. The Fundación Patuca is actively attempting to document the biodiversity within the park's boundaries. In this article, we present the results of the expedition.

Because this region consisted of steep hills difficult to traverse, most sites were explored by locating and following streams and investigating as much stream and adjacent border area as possible. All areas were explored during the day and at night. Daytime collecting consisted of surveying low vegetation and the forest floor for active amphibians and reptiles, turning rocks and logs, and raking through leaf litter. Nocturnal surveys were conducted by walking along or within streams and searching low vegetation and the forest floor for active and sleeping reptiles and amphibians. Species that could be positively identified but not captured or located (e.g., crocodiles, calling amphibians) were noted. Surveys were generally conducted for at least 8 hours daily and 6 hours nightly. Representatives of all species collected were preserved and deposited at the United States National Museum, Washington, D.C., USA (USNM) or the Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt, Germany (SMF).

Surveys were conducted from 2 to 12 November 1999 by exploring four areas along the Río Cuyamel and Río Patuca. The first site, Matamoros (14° 40' 21", 85° 23' 11"), is located at 150 m elevation adjacent to the Río Cuyamel and is largely deforested for about one to two kilometres inland from the river's edge. It is in this area that pilot projects for sustainable yield agriculture are being initiated. Matamoros is located in an area of steep hills interspersed with small, steep-sided streams. Secondary forest surrounds most of the small streams but much of the hillsides are deforested. Streams were small and contained clear, rapid water-flow with rocky or sandy bottoms interspersed with occasional leaf-litter. The second site, Quebrada El Mono (14° 38' 49", 85° 19' 52"), lies at 100 m elevation and is located down river from Matamoros near the confluence of the Río Cuyamel with the Río Patuca. Cattle were present at the river's edge and on hillsides directly above the river. This area was explored by following a stream approximately 1 km inland. The first 200 m of stream closest to the Río Cuyamel is surrounded by secondary forest with some flat terrain along the banks, but the remainder of the stream explored has steep hillsides covered by primary forest. The stream contains a muddy bottom near its confluence with the Río Cuyamel, but further inland the bottom is rocky with clear, rapid water-flow. The third site surveyed, Quebrada El Guasimo (14° 34' 38", 85°

17' 54"), lies at 140 m elevation along the Río Patuca upriver from its confluence with the Río Cuyamel. This site consists of steep slopes adjacent to the river's edge followed by relatively flat areas alongside several streams. One stream was surveyed for approximately 3 km upstream where the elevation increased only ca. 10 m. The entire area around the Quebrada El Guasimo locality contains primary lowland rainforest. The streams at the Guasimo locality are clear and slow-flowing with rocky bottoms interspersed with pools containing leaf litter. Similar to the stream at the Quebrada El Mono locality, the streams at the Guasimo locality contain muddy bottoms near their confluence with the Río Patuca. The last site, Caobita (14° 39' 22", 85° 17' 43"), is located at 100 m elevation along the Río Patuca downriver from the Río Patuca's confluence with the Río Cuyamel. There was substantial deforestation evident along the river's edges and cattle were present, but the bordering vegetation is comprised of primary forest. There were few streams at this site but the surrounding forest was made amenable to exploration via trails and passable topographic relief.

A total of forty-six species of amphibians and reptiles were observed within the park. A list of these species is presented below. Terms defining habitat, diel activity, and abundance included in this list are: terrestrial (active on the ground or under surface debris); arboreal (active on low vegetation); aquatic (active and feeding in water); diurnal (active during the day); nocturnal (active at night); common (many individuals can be found); infrequent (unpredictable, few individuals seen, found at only one or two localities); rare (rarely seen).

CLASS AMPHIBIA

FAMILY BUFONIDAE

Bufo haematiticus Cope
Remarks: Terrestrial; nocturnal/diurnal; infrequent; found near streams in primary forest.
Localities: Quebrada El Guasimo; Quebrada El Mono.

Bufo marinus (Linnaeus)
Remarks: Terrestrial; nocturnal; infrequent; found around human habitation and river edges.
Localities: Matamoros; Quebrada El Mono.

Bufo valliceps Wiegmann
Remarks: Terrestrial; nocturnal; common; found in highly disturbed areas and in primary and secondary forests.
Localities: Caobita; Matamoros; Quebrada El Guasimo; Quebrada El Mono.

FAMILY CENTROLENIDAE

Cochranella albomaculata (Taylor)
Remarks: Arboreal; nocturnal; rare; found along a stream within primary forest.
Localities: Caobita.

Cochranella granulosa (Taylor)
Remarks: Arboreal; nocturnal; rare; found along a stream within secondary forest.
Localities: Matamoros.

Hyalinobatrachium cardiacalyptum McCranie and Wilson
Remarks: Arboreal; nocturnal; common; found along streams within primary and secondary forest, particularly during or after rainshowers.
Localities: Caobita; Matamoros; Quebrada El Guasimo.

FAMILY HYLIDAE

Agalychnis calcarifer Boulenger
Remarks: Arboreal; nocturnal/diurnal; rare; only eggs and tadpoles found in a water-filled depression of a fallen log in primary forest; adults reside in the canopy and males descend to call during the late night-early morning hours (1900 - 0530 h; Marquis et al. 1986), although eggs are sometimes deposited during late morning (about 0800 - 1200 h; Caldwell, 1995). We heard a single male make several calls between 0800 - 0900 h from high up a tree near the fallen log containing the eggs and tadpoles. Another male made a single call at 0445 h from a tree about 50 m from the fallen tree.
Localities: Quebrada El Guasimo.

Hyla microcephala Cope
Remarks: Arboreal; nocturnal; rare; several males heard calling from an inaccessible lagoon formed by an overflow from the Río Cuyamel; none collected.
Localities: Matamoros.

Smilisca baudinii (Duméril and Bibron)
Remarks: Arboreal; nocturnal; infrequent; a few males heard calling and tadpoles collected in pools left behind by a receding large stream; found in disturbed areas.
Localities: Caobita (calling males); Matamoros (tadpoles).

Smilisca phaeota (Cope)
Remarks: Arboreal; nocturnal; rare; found along a stream through secondary forest.
Localities: Matamoros.

FAMILY LEPTODACTYLIDAE
Eleutherodactylus fitzingeri (Schmidt)
Remarks: Terrestrial (or perched on vegetation less than 0.5 m from ground); nocturnal; common; found near streams through primary and secondary forest.
Localities: Caobita; Matamoros; Quebrada El Guasimo; Quebrada El Mono.

Eleutherodactylus lauraster Savage, McCranie, and Espinal
Remarks: Terrestrial; diurnal; infrequent; found in primary forest in areas with much leaf litter.
Localities: Caobita; Quebrada El Guasimo.

Eleutherodactylus noblei Barbour and Dunn
Remarks: Arboreal; nocturnal; rare; found in primary forest.
Localities: Caobita.

Eleutherodactylus ridens (Cope)
Remarks: Arboreal; nocturnal; infrequent; found in primary forest.
Localities: Caobita; Quebrada El Guasimo.

Leptodactylus pentadactylus (Laurenti)
Remarks: Terrestrial; nocturnal; infrequent; found in primary and secondary forest near small streams.
Localities: Matamoros; Quebrada El Guasimo.

FAMILY RANIDAE
Rana berlandieri Baird
Remarks: Terrestrial; nocturnal; infrequent; found near a large stream in a highly disturbed area and in secondary forest.
Localities: Matamoros.

Rana maculata Brocchi
Remarks: Terrestrial; nocturnal; infrequent; found near streams through secondary forest.
Localities: Matamoros; Quebrada El Mono.

Rana vaillanti Brocchi
Remarks: Terrestrial; nocturnal; infrequent; found alongside Río Cuyamel; seen, but not collected near a lagoon formed by an overflow of the Río Cuyamel.
Localities: Matamoros (not collected); Quebrada El Mono.

Rana warszewitschii (Schmidt)
Remarks: Terrestrial; nocturnal/diurnal; infrequent; found near steams through primary forest.
Localities: Quebrada El Guasimo.

FAMILY PLETHODONTIDAE
Bolitoglossa striatula (Noble)
Remarks: Arboreal; nocturnal; infrequent: found near streams through secondary and primary forest.
Localities: Quebrada El Guasimo; Quebrada El Mono.

CLASS REPTILIA
FAMILY CROCODYLIDAE
Crocodylus acutus (Cuvier)
Remarks: Aquatic; nocturnal/diurnal; common; this species was not collected, but was frequently seen sunning along the banks of the Ríos Cuyamel and Patuca; a juvenile was seen at night in a shallow back water area of the Río Cuyamel at Quebrada El Mono and an adult was seen at night at the mouth of a large stream at Caobita.

FAMILY BOIDAE
Boa constrictor Linnaeus
Remarks: Terrestrial/arboreal; nocturnal; rare; no specimens encountered, but a clearly identifiable shed skin was found in vegetation alongside the Río Patuca.
Localities: Quebrada El Guasimo.

FAMILY COLUBRIDAE
Dendrophidion percarinatum (Cope)
Remarks: Terrestrial; diurnal; rare; one specimen found sleeping at night about 1.5 m above the ground along a stream through primary forest.
Localities: Quebrada El Guasimo.

Dryadophis melanolomus (Cope)
Remarks: Terrestrial; diurnal; rare; one specimen was found in secondary forest.
Localities: Quebrada El Mono.

Imantodes cenchoa (Linnaeus)
Remarks: Arboreal; nocturnal; rare; one specimen found in primary forest.
Localities: Caobita.

Lampropeltis triangulum (Lacépède)
Remarks: Terrestrial; diurnal; rare; one specimen found active during the day in primary forest.
Localities: Caobita.

Leptophis ahaetulla (Linnaeus)
Remarks: Terrestrial/arboreal; diurnal; rare; one specimen found crawling up a tree trunk in primary forest.
Localities: Caobita.

Oxybelis brevirostris (Cope)
Remarks: Arboreal; diurnal; rare; one specimen found sleeping at night on a palm leaf about 2.5 m above a stream through primary forest.
Localities: Quebrada El Guasimo.

FAMILY VIPERIDAE
Bothrops asper (Garman)
Remarks: Terrestrial; nocturnal/diurnal; rare; one specimen found at night coiled on a log above a stream in primary forest.
Localities: Caobita.

FAMILY EMYDIDAE
Rhinoclemmys annulata (Gray)
Remarks: Terrestrial; diurnal; rare; found sleeping at night while half buried in mud in a small, shallow side pool of a small stream in primary forest.
Localities: Quebrada El Guasimo.

Rhinoclemmys pulcherrima (Gray)
Remarks: Terrestrial (semi-aquatic); nocturnal/diurnal; rare; the single specimen found was active at night in a stream within primary forest, an unusual habitat for this species.
Localities: Quebrada El Guasimo.

Trachemys scripta (Schoepff)
Remarks: Aquatic; nocturnal/diurnal; common; frequently seen sunning on banks of Río Patuca, one specimen collected during the day.
Localities: Quebrada El Guasimo.

FAMILY KINOSTERNIDAE
Kinosternon leucostomum (Duméril and Bibron)
Remarks: Terrestrial (semi-aquatic); nocturnal/diurnal; rare; found active during the day in primary forest near a small stream.
Localities: Quebrada El Guasimo.

FAMILY CORYTOPHANIDAE
Basiliscus plumifrons Cope
Remarks: Arboreal; diurnal; common; frequently encountered perched on limbs or vegetation along waterways. Also can be found sleeping at night in the same situations.
Localities: Matamoros; Quebrada El Guasimo; Quebrada El Mono.

Basiliscus vittatus Wiegmann
Remarks: Arboreal; diurnal; common; commonly found sleeping at night on vegetation near watercourses through highly disturbed areas and secondary forest.
Localities: Matamoros; Quebrada El Mono.

FAMILY GEKKONIDAE
Sphaerodactylus millepunctatus Hallowell
Remarks: Terrestrial/arboreal; diurnal; infrequent;

found in the vicinity of a dwelling, either walking on building supports or under debris on the ground.
Localities: Matamoros.

Thecadactylus rapicauda (Houttuyn)
Remarks: Arboreal; nocturnal; infrequent; found in a single dwelling; local people call this species "talconete" and believe that they will kill you with a sting from their tail.
Localities: Matamoros.

FAMILY IGUANIDAE
Iguana iguana (Linnaeus)
Remarks: Terrestrial/arboreal; diurnal; common; seen in vegetation and on the ground along the Ríos Patuca and Cuyamel; not collected.

FAMILY POLYCHROTIDAE
Norops capito (Peters)
Remarks: Arboreal; diurnal; infrequent; their dorsal coloration is lichen - like, thus camouflaging them against trees and making them difficult to see; found in primary forest.
Localities: Quebrada El Guasimo.

Norops cupreus (Hallowell)
Remarks: Arboreal (never perched higher than 1 m above ground); diurnal; infrequent; found in primary forest.
Localities: Quebrada El Guasimo.

Norops humilis (Peters)
Remarks: Terrestrial; diurnal; common; usually found in primary forest, occasionally in secondary forest.
Localities: Matamoros; Quebrada El Guasimo.

Norops lemurinus (Cope)
Remarks: Arboreal; diurnal; rare; these lizards are known to inhabit trunks of trees and may ascend higher, making observations difficult; one specimen was found in secondary forest.
Localities: Caobita; Quebrada El Mono.

Norops limifrons (Cope)
Remarks: Arboreal; diurnal; common; found frequently on small perches of shrubs, saplings, palms or other vegetation less than 2 m above the ground; also commonly found sleeping on low vegetation at night; found in primary and secondary forest.
Localities: Matamoros; Quebrada El Guasimo; Quebrada El Mono.

Norops oxylophus (Cope)
Remarks: Terrestrial; diurnal; common; this species is considered 'semi-aquatic' and is frequently encountered along small streams or their banks while active during the day or sleeping at night; found in primary and secondary forest.
Localities: Caobita; Matamoros; Quebrada El Guasimo; Quebrada El Mono.

FAMILY SCINCIDAE
Sphenomorphus cherriei (Cope)
Remarks: Terrestrial; diurnal; common; found running through leaf litter in primary forest.
Localities: Caobita; Quebrada El Guasimo.

FAMILY TEIIDAE
Ameiva festiva (Lichtenstein and Von Martens)
Remarks: Terrestrial; diurnal; common; found in open areas along watercourses and in sunny spots in primary and secondary forests.
Localities: Caobita; Quebrada El Guasimo.

DISCUSSION

We recorded 46 species of amphibians and reptiles from Parque Nacional Patuca. The forests of this park belong to the Lowland Moist Forest formation (as slightly modified from Holdridge, 1967). A total of 171 species of amphibians and reptiles are known from this forest formation on the mainland of Honduras (McCranie, unpub. data). However, some of these species occur only in western to north-central Honduras, and would not be expected to occur in the Patuca region. Thus, the total number of species known from this forest formation in Honduras and expected to be found in the Patuca region is 105 species

(McCranie, unpub. data). Therefore, our expedition only encountered 43.8% of the species expected to occur in the Patuca region (a few 'weed species' that occur in highly disturbed areas may be found in such areas of the park that are already completely deforested; these 'weed species' are not included in the total of 105 species). The segment of the herpetofauna most lacking from our expedition is the snakes. We recorded only 8 of the 45 species (17.8%) expected to occur in the Patuca National Park. Additionally, a few herpetofaunal species not presently known to occur in Honduras, but recorded from nearby in the Bosawas Biosphere Reserve in northern Nicaragua, may eventually be found in the Parque Nacional Patuca (e.g., *Eleutherodactylus cerasinus, E. diastema, Leptophis depressirostris, and Sibon annulatus;* Köhler, 1999).

Three species of amphibians, each previously known in Honduras from single specimens, were collected on this expedition. The first species, *Cochranella granulosa*, was recently documented in Honduras from 680 m elevation in a Premontane Wet Forest formation locality (McCranie et al., 1999). The Patuca locality for *C. granulosa* lies ca. 65 airline km SSW of the previous known Honduran locality, and ca. 50 airline km NNW of the nearest known Nicaraguan locality (ca. 3 km SE Ayapal at Río Curinwás, Departamento de Jinotega; Köhler, 1999). The second species, *Agalychnis calcarifer*, is known from the Lowland Moist Forest formation, but has only recently been documented from the country. The single Honduran adult was collected in 1992 near Baltiltuk, Departmento de Gracias a Dios, in eastern Honduras (Cruz Díaz & McCranie, 1999). Previous to the discovery of that specimen, the closest known locality for *A. calcarifer* was Río San Juan, Departamento de Río San Juan, Nicaragua (Caldwell, 1995). Our collection of *A. calcarifer* eggs and tadpoles on this expedition extends the range in Honduras ca. 140 airline km SSW of the Baltiltuk locality. The Patuca locality lies ca. 420 airline km NNW of the Río San Juan locality for *A. calcarifer*. The third species, *Bolitoglossa striatula*, is known from the Lowland Moist Forest formation along the Atlantic versant from northeastern Honduras to central Costa Rica. The previous known Honduran specimen was collected in 1933 at Kropunta (4 km north of Ahuás), Departamento de Gracias a Dios, in northeastern Honduras. The individuals we collected extend the known range in Honduras ca. 150 airline km SW of Kropunta. Additional collecting in Parque Nacional Patuca will likely document the occurrence of other poorly known Honduran species in this national park.

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BOOK REVIEW

'Erkrangungen der Amphibien'

By Frank Mutschmann. Parey Buchverlag, Berlin. 1998.
ISBN 3-8263-3095-1

Despite centuries of study of amphibians and reptiles and the appearance of many books and papers on their basic biology, publications on the diseases of these animals are few and far between. Additions to the list are, therefore, always to be welcomed.

Dr. Frank Mutschmann's book is in German and the text is based largely on his work in the Tierpark (formerly the 'East Berlin Zoo'), coupled with references to related studies in many other parts of the world.

The 20 chapters cover a wide range of subjects, from ecology, anatomy, and physiology, to disorders of organ systems, infectious diseases, anaesthesia, and euthanasia. The emphasis is rather more on pathology than on clinical work but both the material and the advice are sound. There are many illustrations – regrettably all black-and-white – and a number of useful tables.

All those who keep, breed, or treat amphibians should be aware of this book. Herpetologists and veterinary surgeons with only a limited knowledge of German will find it useful reference and a convenient door to other published works. At a time when authoritative texts on the health and diseases of amphibians are much needed, this volume is a useful addition to the armoury of both the herpetologist and veterinary surgeon.

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THE HERPETOLOGICAL BULLETIN

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BRITISH HERPETOLOGICAL SOCIETY

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FORUM

COMMENTS ON 'A NEW ADDITION TO EGYPT'S HERPETOFAUNA: *COLUBER ALGIRUS* (JAN, 1863)' by S. BAHAH EL DIN

HERPETOLOGICAL BULLETIN
NO. 72, pp. 2-3.

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NOT since John Anderson published his beautifully illustrated monographic study in 1898 has a major work on Egypt's herpetofauna appeared other than that of Saleh (1997). Since Anderson's time, only a few amphibian and reptile taxa have been added to the Egyptian fauna, and Baha El Din is one of a few contemporary Egyptian herpetologists whose contribution to the herpetofaunal knowledge of the region is widely recognised.

The two-page article in question includes an introduction, results and discussion, acknowledgements, and reference citations. The morphological description of the snake is concise, but fails to address some important characters, such as the shape of the snout and head scales; e.g. rostral, loreal, nasal, frontal, parietal, temporals....etc. Since the author has deposited his single specimen in his private collection, it would also have been helpful to provide a full morphological and morphometric account of the snake, especially when it serves as a new taxon to the country's fauna.

The author did not provide independent verification of the snake's identity. In his similarly short account, Baha El Din (1996) described a specimen of the worm snake, *Ramphotyphlops braminus*, also without

independent substantiation, considering it a new addition not only to the Egyptian but also the North African snake fauna. The omission of this detail does not necessarily mean that the identification is dubious, but it is usual practice for range extensions to be corroborated in this way.

The author fails to mention any Egyptian herpetological reference. He stated that there are 36 species of snakes in Egypt, and although this is correct, he could have cited the most recent book on the amphibian and reptiles of the country as a reference (see Saleh, 1997, p. 36.).

The author speculated that *Coluber algirus* could potentially be confused with *Coluber rogersi* in Marsa Matruh region. Nevertheless, he describes in the same paragraph how the two species differ significantly in terms of colour and pattern. This is a contradiction. Moreover, *C. algirus* does have a black band on the nape, while *C. rogersi* does not. It is not impossible for the informed reader to differentiate between the two species. The author cites Anderson, 1896 when in fact the correct one should be Anderson, 1898. However, neither of these works was listed in the literature citations.

The author states that 'six other snakes belonging to the genus *Coluber* are known from Egypt', yet he unintentionally lists only five. Saleh (1997) cited seven snakes from the genus *Coluber* including *C. elegantissimus*. However, only six species could be considered since he did not refer to a definite locality of the latter snake in Egypt. Again, the author did not mention the Egyptian reference (see Saleh, 1997, pp. 139-146). Despite this paper's inconsistencies, the inclusion of *C. algirus*, based on the information provided and the fairly good monochrome photograph, could still be a valid addition to the herpetofauna of Egypt.

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