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THE BRITISH HERPETOLOGICAL SOCIETY

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The British Herpetological Society was founded in 1947 by a group of well-known naturalists, with the broad aim of catering for all interests in reptiles and amphibians. Four particular areas of activity have developed within the Society:

The Captive Breeding Committee is actively involved in promoting the captive breeding and responsible husbandry of reptiles and amphibians. It also advises on aspects of national and international legislation affecting the keeping, breeding, farming and substainable utilisation of reptiles and amphibians. Special meetings are held and publications produced to fulfil these aims.

The Conservation Committee is actively engaged in field study, conservation management and political lobbying with a view to improving the status and future prospects of our native British species. It is the accepted authority on reptile and amphibian conservation in the UK, works in close collaboration with the Herpetological Conservation Trust and has an advisory role to Nature Conservancy Councils (the statutory government bodies). A number of nature reserves are owned or leased, and all Society Members are encouraged to become involved in habitat management.

The Education Committee promotes all aspects of the Society through the Media, schools, lectures, field trips and displays. It also runs the junior section of the Society - THE YOUNG HERPETOLOGISTS CLUB (YHC). YHC Members receive their own newsletter and, among other activities, are invited to participate in an annual "camp" arranged in an area of outstanding herpetological interest.

The Research Committee includes professional scientists within the ranks of the Society, organises scientific meetings on amphibian and reptile biology and promotes The Herpetological Journal, the Society's scientific publication.

Meetings
A number of meetings and events take place throughout the year, covering a wide range of interests.

Publications
The BHS Bulletin, Herpetological Journal and YHC Newsletter are all produced quarterly. There are in addition a number of specialised publications available to Members and produced by the various Committees, such as notes on the care of species in captivity, books and conservation leaflets.

Subscriptions
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The Society does not, as a body, hold itself responsible for statements made or opinions expressed in the Bulletin; nor does the Editorial necessarily express the official opinion of the Society.

The Bulletin is edited and produced by
Simon Townson and John Spence.
Contributions and correspondence arising from the Bulletin should be sent to:
John Spence, 23 Chase Side Avenue, Enfield, Middlesex EN2 6JN

FRONT COVER
Mabuya perroteti from Mali. See article on P.7 by Böhme *et al.*

REMAINING BRITISH HERPETOLOGICAL SOCIETY MEETINGS FOR 1996

Meetings are usually held at Birbeck College, Malet Street, London WC1, unless otherwise stated

October 11th — Captive Breeding meeting – Lord Grey School, Milton Keynes: Joint meeting with Milton Keynes H.S.: Stephen Divers – Captive Care of the Green Iguana – Start 8.00 pm.

October 26th — Autumn General Meeting. Birbeck College London. (a) Prof. J. Davenport, Isle of Cumbrae, Scotland: "Intertidal Maderian Lizards – Miniature Marine Iguanas". (b) To be arranged.

November 10th — Captive Breeding Open Day – New Denham; 2 - 5 pm.

December 7th — Research meeting – Birbeck College.

BHS NORTH WEST MEETINGS 1996

October 8th — Yet to be decided.

December 3rd — Christmas Social

All meetings commence at 8.00 pm except where stated and are all held at Wildfowl and Wetlands Centre, Martin Mere, Burscough, Lancs. Tel: 01704 895181.

HERPETOLOGICAL JOURNAL REPORT 1995

In 1995 manuscript submissions to the *Herpetological Journal* increased by some 30% on the previous year, which was itself a record year for papers received. As the acceptance rate has remained about the same as in previous years, the number of published pages will increase slightly to accommodate additional papers which are eventually accepted. However, if submissions continue to increase, the rejection rate will no doubt rise from its present 38%. Although disappointing for some authors, such a trend will increase the scientific standing of the journal, and hopefully this will be eventually reflected by an increased number of subscribers. Indeed, at £25 for four journals and four Bulletins, BHS membership probably represents the best value for money out of all the scientific herpetological societies. With institutional subscriptions now covering the production costs, journal and reprint sales actually make a small profit for the society each year. The time lag between acceptance and publication is now between 5-9 months. Again, this compares very favourably with other scientific journals. This situation has inevitably resulted in an increased workload for the editorial team and referees. In fact referees are now taking slightly longer than in previous years to turn manuscripts round, although this trend is probably a general feature of most scientific journals. Thanks to Leigh Gillett for proof reading all the manuscripts, and to Siobhan Keeling who completed her term as Associate Editor. Her replacement is Lesley Constantine, who will make a start on constructing a database for streamlining the manuscript processing procedure.

Richard Griffiths
Editor

TWENTY YEARS OF GARDEN PONDS

TREVOR BEEBEE

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INTRODUCTION

This article is the story of amphibian activity in three garden ponds that were built at my home shortly after we moved in during the winter of 1976-7. Mostly I have just watched the animals in these ponds for pleasure, but I have also kept records of obvious events such as numbers of frogspawn clumps laid each year, and numbers of frogs killed and left lying around the garden by predators (mainly foxes). In 1986 I estimated population sizes of the four newt species in the 3 ponds using a mark-recapture method, and celebrated the first ten years of observations with an article in the BHS Bulletin (Beebee, 1986). Another ten years on I repeated the mark-recapture exercise again using the same methods, and here I report all the information put together to cover the entire 20 years 1977-1996 inclusive. One significant addition to the pond environment was the introduction, in 1991, of Three-Spined Sticklebacks to the largest pond (number 3). These fish have bred prolifically over the past 5 years, but no other fish are present in pond 3 and there are still no fish of any kind in ponds 1 and 2.

OBSERVATIONS

Frogs and Toads

Common Frogs were introduced to the ponds as a few spawn clumps in spring 1977. As shown in Figure 1, frog numbers (as judged by spawn clump counts) rose sharply over the first 5 years and remained high throughout the 1980s. Virtually all frog breeding has always been in just one of my three ponds, the largest and sunniest (pond 3). However, in the early 1990s there was a sharp decline and for the past three Springs spawn clumps have been at less than 20% of their average number during the 1980s. Although not measured properly, it was clear that this decline followed breeding failure which set in during the late 1980s, and scarcely any froglets have emerged from the pond over the past decade. This in turn followed a huge increase in newt populations, which by the mid 1980s had reached several hundred individuals. The newts could be watched after dark lining up around hatching frog-spawn and devouring tadpoles with devastating efficiency. I have no doubt that it was the success of the newts which led to problems for the frogs. There have been no outbreaks of frog disease in my garden or anywhere near it as far as I know, and no other reason has presented itself (or seems necessary) to explain the frog declines.

As also shown in Figure 1, quite a few frogs have been killed by foxes in the garden during the spawning seasons. Altogether over the past 20 years I have counted 190 corpses, with almost twice as many males (122) as females (68) being killed in this way. There does seem to be a weak density-dependence to this predation, with more frogs killed in years when lots of spawn was laid than in years when fewer frogs were about (as shown in Figure 2). However, the trend was only just statistically significant ($r = 0.496$, $df = 16$, $P<0.05$) and I suspect predation rate depends largely on where the nearest fox happens to be living at the time.

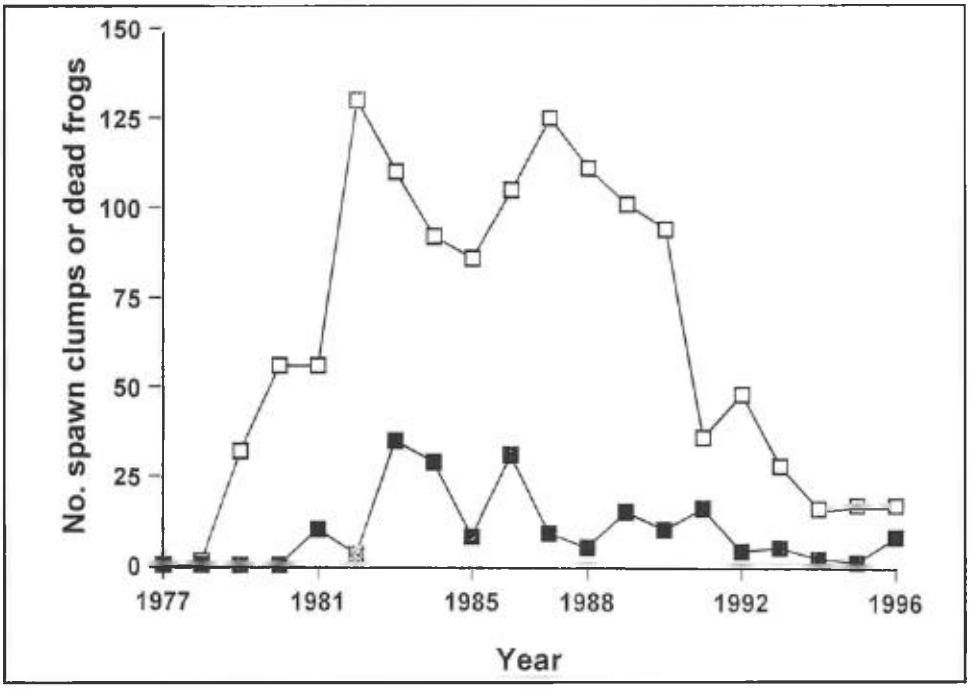

Figure 1. Numbers of frog spawn clumps (■) and of frogs killed by predators (□) over 20 years.

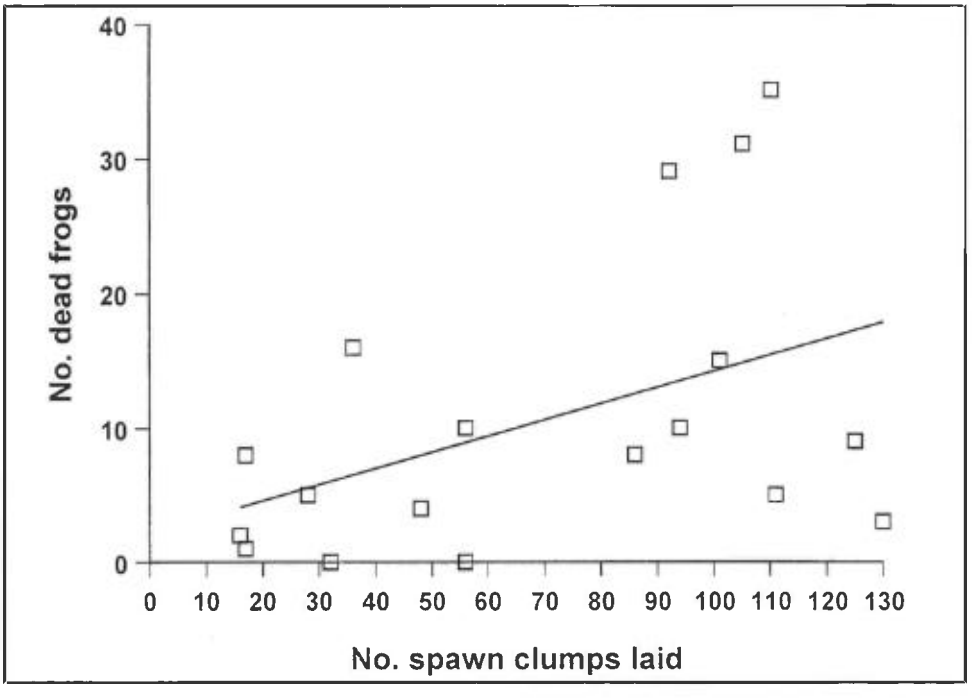

Figure 2. Correlation between spawn laid and predation of adult frogs.

Common Toads have never established themselves in any of the three ponds despite many efforts over the first decade to introduce them as spawn. For some inexplicable reason toad spawn and tadpoles develop very slowly in my ponds and scarcely ever survived to metamorphosis even before newt numbers became high. I have tried to find out what happens to kill off the toad tadpoles, but without much success. There are, for example, three beasts in pond 3 which I suspected might be predators of the toad tadpoles: Alpine Newts, Horse Leeches and large (hawker) dragonfly nymphs. But when I carried out trials under controlled conditions, neither the newts nor the leeches took any toad tadpoles at all and even the dragonfly nymphs didn't catch more than one or two over 24 hours. Predation could not in any case explain the peculiarly slow growth rates of toad tadpoles, which I see every year whichever pond I put them in and which are quite unlike those of frogs in the same pond. Tests with pond water were inconclusive, except in one trial with water and pondweed which did seem to replicate events in the ponds. The guts of the tiny tadpoles became packed with huge numbers of a ciliate protozoan, which might be a parasite but which equally could be a result rather than a cause of the tadpoles' difficulties. I would be interested to hear from anyone else who has this kind of experience with toad tadpoles. However, on a brighter note a single pair of toads spawned in my ponds in 1995 and two pairs in 1996 (the second right at the end of May!) and there may be some hope for the future now pond 3 has been deserted by Crested Newts; all the other newt species leave the distasteful toad tadpoles alone. A small mixed population of Edible and Pool Frogs (about 20 adults) also lives in and around the three ponds, and enjoys occasional breeding success in warm summers. 1995 was particularly good.

Newts

The three native newts and just 5 Alpine Newts were introduced to the ponds in 1977. Ten years later all four species were still present and breeding regularly, with Smooth Newts dominant but Alpines also dramatically successful. As shown in Table 1, all four species were still present after 20 years but there were some changes. The introduction of sticklebacks to pond 3 was made with the express purpose of reducing newt numbers in that pond, and thus relieving pressure on the frogs. Sticklebacks are thought to be highly effective predators of newt larvae, but in my experience have little or no impact on frog tadpoles.

Table 1. Estimates of newt numbers.

Numbers are mark-recapture estimates, with standard deviations in parentheses.

	1986				1996			
Species	Pond 1	Pond 2	Pond 3	Total	Pond 1	Pond 2	Pond 3	Total
Smooth	115(32)	48(15)	364(111)	527	23(12)	25(5)	55(29)	102
Palmate	8(3)	5	13(4)	26	9(5)	0	6(3)	15
Crested	12(4)	0	7(2)	19	7(2)	2(1)	0	9
Alpine	43(12)	16(8)	39(21)	98	33(19)	29(7)	41(10)	103

There were three main changes in the garden newt populations between 1986-1996:
1) Smooth Newt numbers declined substantially, and are currently at only about 20% of

their mid 1980s high. There are still plenty of them, though, and the decline has been greatest (about sevenfold) in pond 3 where the sticklebacks live. The mark-recapture results confirmed in all cases the impressions I was getting from regular torch inspection of the ponds. In 1985-6 the pond floors in mid-spring were virtually carpeted with Smooth Newts, but numbers declined progressively after that time.
2) Unique among the four species, Alpine Newt numbers have remained at more or less exactly their 1986 levels. Because of the Smooth Newt declines this means they are now the co-dominant species in the ponds. They have not declined at all in the stickleback pond, although it is now rare (but not unknown) to see any newt larvae in that pond.
3) Crested Newts, uniquely among the four species, have deserted the Stickleback pond altogether. This did not happen immediately; adult Crested Newts continued to use the pond, in slowly decreasing numbers, between 1991 and 1995 (when a single male was seen there). In 1996 no Crested Newts at all were seen in pond 3, and there have certainly been no Crested Newt larvae in there since 1991.

A particularly interesting discovery in pond 1 in 1996 was a male newt fitting the description of a Smooth x Palmate hybrid, as reported previously on only one other occasion in the wild as far as I know (Griffiths, Roberts & Sims, 1987). This animal, duly photographed, had a low and weakly-undulating crest, strongly-spotted sides and belly and red and blue streaks along the bottom of the tail, all typical Smooth Newt characters; but also prolific golden spots on the head, "palmaty" lateral tail colouration, a squarish body section with pronounced lateral folds and a distinct tail truncation and filament, all characteristic of Palmates. The hindfeet had intermediate webbing, and total length was about 93 mm, both features halfway between what is typical of the two species.

DISCUSSION

Garden ponds, with their relatively small sizes and artificial liners, undoubtedly differ from natural pools with respect to the types of wildlife that prosper in them. Even so, carefully designed garden ponds do have realistic natural attributes and at least in some respects may serve as models for what happens in wilder places. In my garden, the impression over the first 20 years is that frogs are very effective pioneers, colonising rapidly and expanding quickly to high numbers. However, as tadpole predators that increase more slowly (in this case newts) become established there may be a kind of natural succession in which frogs are reduced and perhaps, in a few more years, they will be eliminated altogether. It is certainly striking that in dewponds on the Downs, the nearest natural ponds in our area, newt populations are widespread but frogs and toads are very rare except in new or newly-renovated ones. Interestingly, most garden ponds have goldfish and this seems to be good news for frogs. Although the fish undoubtedly eat some tadpoles, it is very unusual to find any type of newt doing well in goldfish ponds and frog populations seem to survive, in quite large numbers, for decades in such ponds (several of which I know in the Brighton area).

Toads have proved very enigmatic. Most garden colonies of toads in Brighton are in the oldest (>20 years) ponds, and I wonder whether mine might eventually be taken over by them. The recent breeding efforts by a single pair, unassisted by me in any way, are a curious contrast to all the abortive efforts I made in the first decade to establish the species. Even more puzzling has been the reason for the past failures, notably the very slow embryo and tadpole growth rates followed by inexplicable disappearance before metamorphosis. This problem may well be peculiar to my ponds, but it happened in all 3 of them, with both plastic and concrete liners, and it seems to me there is a real mystery here worthy of some further research.

As for the newts, control by sticklebacks has proved ineffective except for Great Crested which seemed, as has long been suspected, particularly susceptible to fish predation of their larvae. It looks as if adult Crested Newts had no way of recognising that sticklebacks made the pond useless for them; they kept trying for years, maybe until adults born in that pond died out. Experiments with American ambystomid salamanders that produce larvae vulnerable to fish predation also showed that the adults had no ability to distinguish fishponds from fish-free ponds, so this may be a general failing of amphibians. Numbers of the other newt species have remained high enough in the stickleback pond to devour virtually all the frog tadpoles, so no salvation for frogs is yet in sight. Maybe bigger fish would do the trick.

The extraordinary success of Alpine Newts has continued for the full 20 years. I am now rather concerned that this might eventually be at the expense of Common Newts, which are evidently in decline. Only more decades will reveal the outcome of all these struggles for survival in a quiet urban garden.

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NEW RECORDS OF AMPHIBIANS AND REPTILES FROM BURKINA FASO AND MALI

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INTRODUCTION

Until 1960, Mali and Burkina Faso (formerly Upper Volta), formed part of French West Africa. The very short list of herpetological activities from that era has been summarised by Papenfuss (1969) who was the first to provide a detailed and exhaustive analysis of the "Mali region", i.e. the central part of the arid West Africa. He suspected that further research would outdate his list rather soon, and subsequent papers by Joger (1981), Schätti (1986), and Lambert & Joger (1994; in press) for Mali, and by Roman (1980) for Burkina Faso (snakes only) proved him to be right. The Alexander Koenig Zoological Research Institute and Museum (ZFMK) at Bonn received in 1983 a small collection of amphibians and reptiles from Burkina Faso, by Harald Meier, which contained some species not recorded from that country until today. Together with some additional new records and voucher specimens collected recently by H. Meinig in Mali and by M.-O. Rödel in Burkina Faso, they form the subject of the present paper.

LOCALITIES

The visited Malian localities are situated in the southern part of the country (see Fig. 1), in the sub-Sahelian belt with a vegetation of the Sudan savanna type (dry woodland) with moister areas in the neighbourhood of the Niger and Bani rivers which are accompanied by some gallery forest. The localities Kita and Bamako lie in dense tree-savanna dominated by *Adansonia digitata, Kaya senegalensis* and *Bombax costatum* . The natural vegetation type of the localities Ségou, Bla and Bandiagara is a much more sparsely distributed dry forest with *A. digitata, Lannea acida, Terminalia macroptera* and *Andropogon* grass communities. Most landscapes are affected by intensive agricultural use. Mainly millet and cotton are cultivated, in the area of the inland delta of the Niger river also rice. The annual precipitation varies between 1200 mm in the south (Kita) and 500 mm in the north (plateau of Bandiagara). Most rainfalls occur between June and September. During the dry season in winter practically no rainfall occurs (data from Barth 1986). As the samples from Mali have been collected from December to February, during 2 short surveys concentrating on the mammalian fauna (Meinig, in prep.), the amphibian and snake species are likely to be much more underrepresented than the lizards.

The Burkina Faso material collected in 1983 has been taken in February (H. Meier), whereas the data by M.-O. Rödel were gathered in June and July 1992. These records have been made in the wet season, mostly around Bobo Dioulasso, but also in a locality close to the border to Ivory Coast, and in the northwest of Ouagadougou (see map, Fig. 1). All habitats lie within the Sudan savanna zone. Typically, they have only a sparse vegetation ("savanne herbeuse": Poilecot 1991). More dense vegetation, forming nearly riverine gallery forests were found close to some creeks at Korho and Daroha (both near Bobo Dioulasso). Collecting near Kafolo was done within cultivated land and on an inselberg. The habitat between Korho and Bobo Dioulasso, as well as the area around Daroha is characterised by impressive rocks within a very dry landscape.

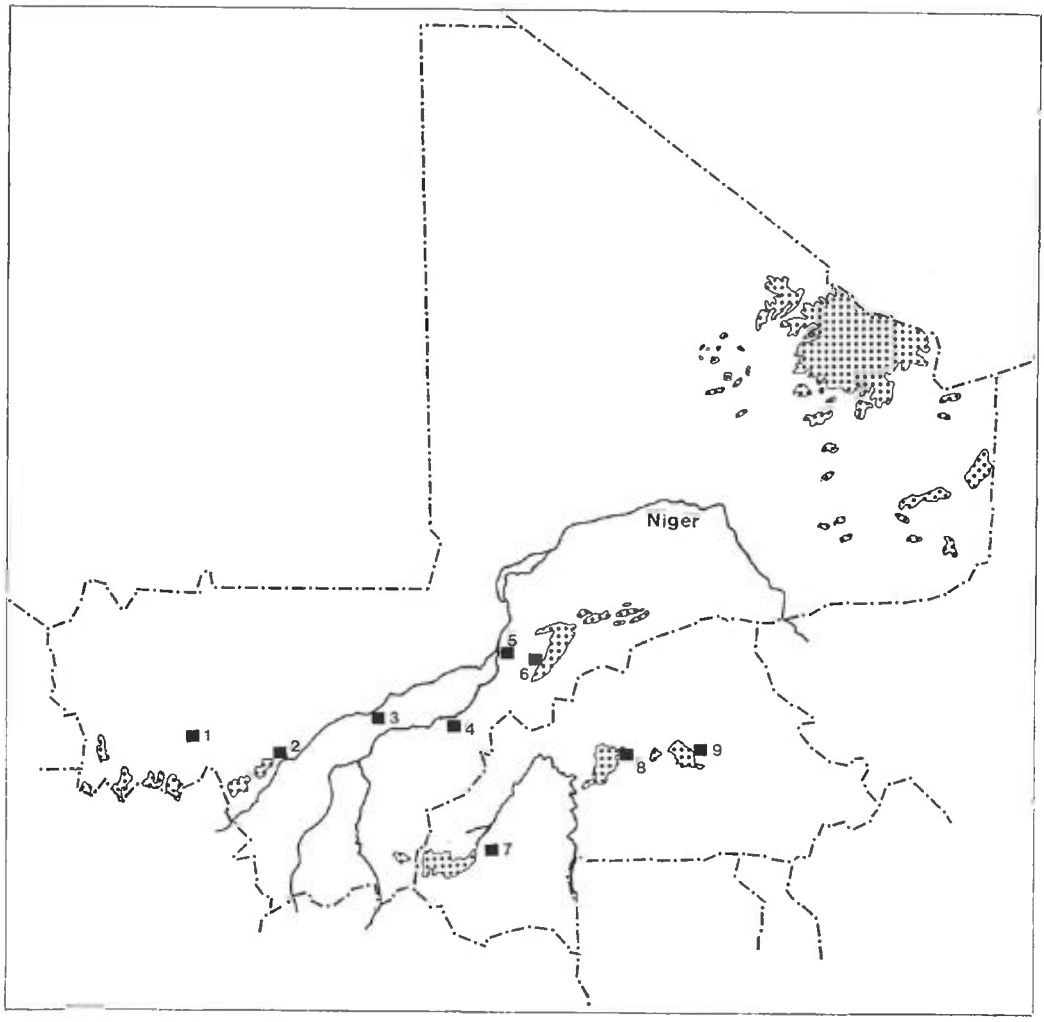

Figure 1. Map of Mali and Burkina Faso showing main localities mentioned in the text: 1 - Kita, 2 - Bamako, 3 - Ségou, 4 - Bla, 5 - Mopti, 6 - Bandiagara, 7 - Bobo-Dioulasso, 8 - Ouagadougou, 9 - Fada N'Gourma. Stippled areas: above 500 m asl. Drawing by H. Meinig.

SPECIES ACCOUNTS

BF = Burkina Faso, M = Mali

Pipidae

Silurana tropicalis Gray, 1864

BF: ZFMK 38688-696, Bobo Dioulasso, H. Meier, 02.1983

The record of this forest species (Arnoult & Lamotte 1968, Loumont 1984) as far inland in arid West Africa as Bobo Dioulasso is very remarkable. The northernmost West

African populations of this species in Gambia (Gruschwitz *et al.* 1991) and Senegal (Casamance: Böhme 1978) are existing in gallery forests relatively close to the coast. The discovery of very similar sibling species of *S. tropicalis*, which is the only diploid form among its congeners, in the Central African forest block (see Loumont 1984, Frost 1985) stresses the necessity to re-examine also this northern savanna population as to its taxonomic identity. Its occurrence in Burkina Faso has also been proven by B. Schneider who found it at Dérégboué (pers. comm.). The only pipid known to occur in this country was so far:

Xenopus muelleri (Peters, 1844)

BF: Daroha, near Bobo Dioulasso, M.-O. Rödel, 14.06.1992

Found in ponds in sparsely vegetated Sudan savanna (not collected), together with *Phrynobatrachus francisci, P. natalensis, Dicroglossus occipitalis* and *Hylarana galamensis* (see below).

Lamotte (1967) and Arnoult & Lamotte (1968) recorded *X. muelleri* already from this country, which represents the westernmost outpost of this species in Africa (Frost 1985).

Bufonidae

Bufo maculatus (Hallowell, 1854)

BF: Korho, outskirts of Bobo Dioulasso, M.-O. Rödel, 14.06.1992

Under wooden logs along a creek several specimens in the Sudan savanna (not collected), more specimens heard calling from other places of the creek. The call was typical for this species as known to us from e.g. Ivory Coast (M.-O. Rödel).

Bufo regularis (Reuss, 1834)

BF: Between Korho and Bobo Dioulasso, M.-O. Rödel, 14.06.1992; M: ZFMK 57167, Bamako, H. Meinig, 15.12.1993; ZFMK 57168, Bla, H. Meinig, 16.12.1993; ZFMK 57173, Ségou, H. Meinig, 21.12.1993; Bandiagara, H. Meinig, 23.12.1993; Djenné, H. Meinig, 3.01.1994; Kita, H. Meinig, 9.01.1994.

The specimens observed in June 1992 near Korho, Burkina Faso, were found at the edge of a creek that was already desiccated except some very small remaining ponds. In Mali, this species was found to be most common in cultivated areas, being active also in the dry season, given that there was a little humidity. In February 1995 some pairs were observed spawning in the river Yamé at Bandiagara.

Bufo pentoni (Anderson, 1893)

BF: ZFMK 59509-510, Daroha (outskirts of Bobo Dioulasso), M.-O. Rödel, 14.06.1995; 3 still uncatalogued specimens 80 km NW of Ouagadougou, M.-O. Rödel, 30.07.1992.

Daroha: Immediately following an unexpected swarming of termites in the hottest noon period numerous adult *B. pentoni* appeared in order to feed on them; there was no rain! Fig. 2 C has been drawn after one of these specimens. Fig. 2 A & B have been drawn after tadpoles found in a puddle at the same locality. The specimens of the second locality kept alive now by one of the authors (M.-O. R.), were found at night during a rainy thunderstorm.

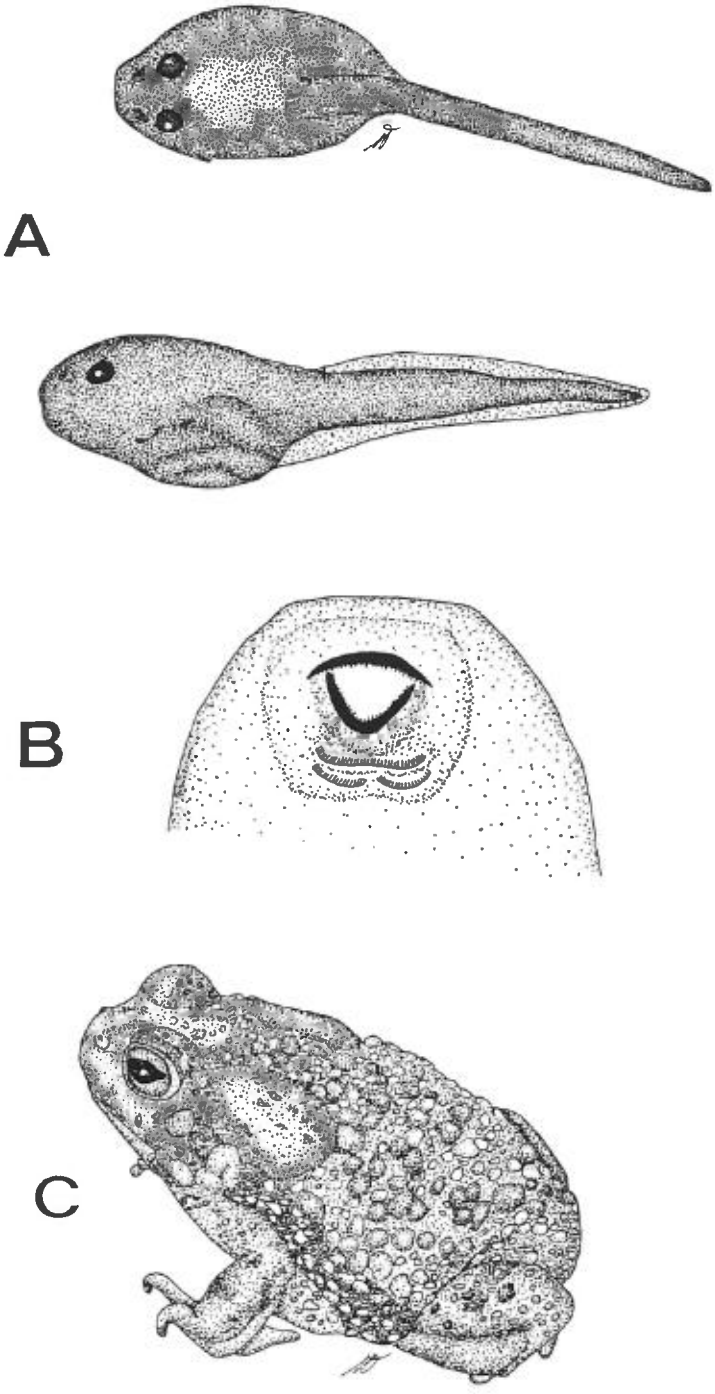

Figure 2. Tadpoles (A: dorsal and lateral views, B: mouthpart) and adult (C) of *Bufo pentoni* from Daroha, Burkina Faso.
Drawing by M.-O. Rödel

Ranidae

Dicroglossus occipitalis (Günther, 1858)

BF: ZFMK 38698-699, Fada N'Gourma, H. Meier, 02.1982; Daroha, M.-O. Rödel, 14.06.1992; M: ZFMK 57180-181, Bandiagara, H. Meinig, 25.12.1993; Djenné, H. Meinig, 3.01.1994; Bamako, H. Meinig, 15.12.1993; Kita, 10.01.1994; between Ségou and Bla, H. Meinig, 15.01.1994; ZFMK 60681, Bla, H. Meinig, 2.02.1995.

This species is extremely common all over Mali and Burkina Faso. In Daroha, adults were observed in June with their spawn. In Mali, it was found in great numbers along the banks of the Niger and Bani rivers. In Bandiagara it was found (December) in little ditches in the dry bed of the Yamé river, in Kita they lived in abandoned wells.

Hylarana galamensis (Duméril & Bibron, 1841)

BF: ZFMK 38700, Fada N'Gourma, H. Meier, 02.1983; Daroha, M.-O. Rödel, 14.06.1992.

The species was observed calling in the latter locality.

Phrynobatrachus francisci (Boulenger, 1912)

BF: near Kafolo/Comoé, M.-O. Rödel, 11.06.1992; Korho, near Bobo Dioulasso, M.-O. Rödel, 14.06.1992; Daroha, M.-O. Rödel, 14.06.1992.

This small-sized sibling of *P. natalensis* (see below) was found calling from shallow ponds during the day, which is also an important field character ("Forme de savane diurne": Lamotte & Xavier 1966). The diurnal activity is confined to the rainy season (Rödel 1995).

Phrynobatrachus natalensis (Smith, 1849)

BF:Daroha, M.-O. Rödel, 14.06.1992

At this locality found in syntopy with the *P. francisci*.

Phrynobatrachus sp.
M:ZFMK 60682, Bandiagara, H. Meinig, 10.01.1995.

This minute frog (13 mm head-body length) has no traces of webs between the toes. Therefore it cannot be referred to the three *Phrynobatrachus* species recorded so far from Mali (Lambert & Joger, in press): *P. francisci* (including *P. monodi* : see Lamotte & Xavier 1966), *P. natalensis* and *P. perpalmatus*.

Ptychadena maccarthyensis (Anderson, 1937)

BF: 80 km NW Ouagadougou, M.-O. Rödel, 30.07.1992.

Ptychadena schubotzi (Sternfeld, 1917)

BF: ZFMK 38701, Fada N'Gourma, H. Meier, 02.1983.

P schubotzi has been redefined by Perret (1981). It is the savanicolous sibling of the forest species *P. longirostris* . Its existence in Mali was discovered by Schätti (1986); the female from Fada N'Gourma is the first record from Burkina Faso.

Hyperoliidae

Afrixalus vittiger (Peters, 1876)

BF: 80 km NW Ouagadougou, M.-O. Rödel, 30.07.1992.

This sibling (not collected) of the forest-dwelling *A. fulvovittatus* (see Perret 1976) was also heard calling at Ouagadougou (M.-O. R.). Despite the general statement in Frost (1985): "Senegal to Ethiopia in savanna", definite records from Burkina Faso are so far lacking (Perret l.c.), so that the above observations represent the first registration of this species in this country.

Kassina fusca (Schiøtz, 1967)

BF: 80 km NW Ouagadougou, M.-O. Rödel, 30.07.1992.

Obviously so far unrecorded from Burkina Faso (Schiøtz 1967, Frost 1985); found in semiarid savanna with a few watering places for cattle.

Leptopelis viridis (Günther, 1868)

BF: 80 km NW Ouagadougou, M.-O. Rödel, 30.07.1992.

Reported from Burkina Faso by Schiøtz (1967) who heard it calling near Yako.

Hemisotidae

Hemisus marmoratus (Peters, 1854)

BF: Halfway between Ouagadougou and Bobo Dioulasso, M.-O. Rödel, 31.07.1992.

Known from several places in Ivory Coast (Lamotte 1967) including the Comoé National Park (bordering Burkina Faso) (Rödel *et al.* 1995 b). This species has obviously not explicitly been recorded from Burkina Faso so far.

Pelomedusidae

Pelomedusa subrufa (Lacépède, 1788)

BF: Korho and Daroha near Bobo Dioulasso, M.-O. Rödel, 14.06.1992; halfway between Bobo Dioulasso and Ouagadougou; M.-O. Rödel, 30.07.1992; M: ZFMK 57191, Wakoro Arrdt, Bla, H. Meinig, 20.12.1993; Ségou, H. Meinig, 01.1994.

Recorded from Burkina Faso already by Papenfuss (l.c.), the species seems to be widely distributed in this country. In Mali, however, only two records have so far been published: Kati (Angel 1922) and Bougouni (Schätti 1986). Our specimens, a mummified juvenile from the edge of a ditch of the Banko river from near Bla, and the Ségou specimen, an adult documented by photographs (ZFMK archives), represent therefore the third and fourth (and also the northernmost) records for Mali.

Pelusios castaneus (Schweigger, 1812)

BF: Near Kafolo/Comoé, M.-O. Rödel, 11.06.1992.

A newly hatched specimen (still kept alive by one of us: M.-O. R.). Ernst & Barbour (1989) listed the West African countries where *P. castaneus* has been recorded. Burkino Faso was not among them. However, Rödel & Grabow (1995) mentioned it from the adjoining Comoé National Park, Ivory Coast. Furthermore, they stress that this species has often been confused with *P. subniger* and *P. niger* .

Crocodylidae

Crocodylus niloticus (Laurenti, 1768)

M: near Bandiagara, H. Meinig, 2.1994.

Nile crocodiles are kept at several places as holy animals in ponds. We found them in three small villages near Bandiagara. Their religious mythical role may be an important factor for their survival in this area.

Agamidae

Agama agama (Linnaeus, 1758)

BF: Korho and Daroha, near Bobo Dioulasso, M.-O. Rödel, 14.06.1992; M: ZMFK 38709-711 and 39027, Fada N'Gourma, H. Meier, 02.1983; ZFMK 57166, Bamako, H. Meinig, 15.12.1993; ZFMK 57172, Bla, H. Meinig, 20.12.1993; ZFMK 57186, Kema Arrdt, Bandiagara, H. Meinig, 31.12.1993; Mopti, H. Meinig, 31.12.1993; Kita, H. Meinig, 9.01.1994.

A. agama proves again to be most widespread and numerous. The specimens observed by M.-O.Rödel lived in rocky habitats, whereas the Malian samples collected and observed by H. Meinig were mostly found in and around human settlements, living also in (hollow) tree trunks; only in the area of the Falaise de Bandiagara was the species also observed in rocky habitats.

Agama sankaranica (Chabanaud, 1918)

BF: ZFMK 39032, near Ouagadougou, H. Meier, 02.1982.

This species is distributed in savannas from Guinea-Bissau to Cameroon (Grandison 1968, Papenfuss 1969, Böhme & Schneider 1987), but has not yet been recorded from Burkina Faso. Our specimen constitutes the first record for this country. The observation by M.-O. Rödel of a ground-dwelling *Agama* different from *A. agama* at Daroha near Bobo Dioulasso indicates the possibility of a much wider distribution of *A. sankaranica* also in Burkina Faso.

Chamaeleonidae

Chamaeleo africanus (Laurenti, 1768)

M: Mopti, H. Meinig, 16.02.1995; Bandiagara, H. Meinig, 02.1995.

C. africanus belongs to those faunal elements that (like also *Mabuya quinquetaeniata* a.o.) range from NE Africa (Red Sea coast) westwards only to Mali, not reaching Senegalese territory (see Böhme 1985).

Chamaeleo senegalensis (Daudin, 1802)

BF: ZFMK 39031, Bobo Dioulasso, H. Meier, 02.1982.

Recorded from several Malian localities (see Papenfuss 1969), this widespread species has obviously not been explicitly recorded for Burkina Faso, wherefore our specimen represents the first documented record.

Gekkonidae

Hemidactylus brooki (Gray 1845)

BF: ZFMK 38702-706, Fada N'Gourma, H. Meier, 02.1982; M: ZFMK 57170-171, Bla, 18-19.12.1993; ZFMK 57174, between Ségou and Séwaré, 50 km NE Bla, H. Meinig 22.12.1993; ZFMK 57179, Bandiagara, H. Meinig, 24.12.1993; ZFMK 57190, Bla, H. Meinig, 11.01.1994.

In contrast to Schätti's experience in Mali, our specimens have been mostly found on roughcasted housewalls (see for example Böhme [1978] for Senegalese, and Håkansson [1981] and Gruschwitz *et al.* [1991] for Gambian populations); only one specimen was found under a piece of bark, in dry savanna landscape.

Ptyodactylus hasselquistii (Donndorff, 1798)

BF: ZFMK 38707-708 and 39030, Fada N'Gourma, H. Meier, 02.1982; ZFMK 59512, between Korho and Bobo Dioulasso, M.-O. Rödel, 14.06.1992; M: ZFMK 57184-185, Bandiagara, H. Meinig, 26.12.1993; ZFMK 60684, Bandiagara, H. Meinig, 16.02.1995; Kema Arrdt, Bandiagara, H. Meinig, 26.12.1993; Kita, H. Meinig, 9.01.1994.

P. hasselquistii, the West African populations of which are considered to represent the subspecies *ragazzii* Anderson, 1898 (Heimes 1987), can establish strong populations in suitable, i.e. rocky habitats. The Burkina Faso locality is characterised by steep rocks, the species being rather common there and active during the day. In Mali, they were particularly numerous in the rocky crevices of the cliffs of the Falaise de Bandiagara. At dawn they began to emit their characteristic short and very loud calls. They were also found in buildings and ruins and in one instance within a cave (Kita).
The last-named locality extends the known distribution area to the west, Mopti having been the westernmost previously known locality (Heimes 1987).

Tarentola annularis (Geoffroy, 1798)

M: ZFMK 57177-178, Bandiagara, H. Meinig, 24.12.1993.

T. annularis, which proved to be very common in Bandiagara (Plate 1), has an unusual disjunct distribution in West Africa. In Mali, its westernmost localities lie around the "inland delta" of the Niger river, westwards it is lacking except some relict populations in westernmost Senegal (Cap Manuel and some offshore islets). Only in the north, in western Mauritania, some isolated populations are known, which are partly coexisting with the following, otherwise mostly vicariant species.

Tarentola parvicarinata (Joger, 1980)

BF: ZFMK 59568, Bobo Dioulasso, M.-O. Rödel, 13.06.1992; M: ZFMK 57165, Bamako, H. Meinig, 14.12.1993, ZFMK 57189, Bamako, H. Meinig, 7.01.1994; ZFMK 60679-680, Bamako, H. Meinig, 25.02.1995; ZFMK 57188, Kita, H. Meinig, 11.01.1994.

All records of this species in Mali, including the two localities documented in this paper, lie west/northwards of the Niger (see Joger 1980: map). Only the record by Schätti (1986) from Bougouni lies southeast of the Niger and reduces the distributional gap towards Bobo Dioulasso, from where the first record from Burkina Faso can be introduced here (Plate 2). The fact, that this find, along with several more specimens not collected, was made in a hotel of a major city, however, may elucidate the strong capability of this species for a passive transport by man, similarly to the situation in Senegal (see Joger 1980).

The two specimens ZFMK 60679-680 were hatchlings. The collecting date (February) fits with the data known so far on its reproductive cycle (Joger l.c.).

Scincidae

Mabuya affinis (Gray, 1838)

BF: ZFMK 38719, Fada N'Gourma, H. Meier, 02.1982.

This species, which is distributed "from northern Angola along the West-African coast to Senegal (Grandison 1956)" (Hoogmoed 1974), enters the savanna mostly along watercourses/gallery-forests (Hoogmoed 1974, Böhme 1978, Gruschwitz *et al.* 1991), and enters the savanna areas of inland Guinea, Ivory Coast and Ghana (Hoogmoed l.c.). It has, however, neither been recorded from Mali (Lambert & Joger, in press) nor from Burkina Faso. The record from Fada N'Gourma is the first one for the latter country.

Mabuya perroteti (Duméril & Bibron, 1839)

BF: ZFMK 38697, Bobo Dioulasso, H. Meier, 02.1982; M: ZFMK 57169, Bla, H. Meinig, 16.12.1993, ZFMK 60683, Bandiagara, H. Meinig, 8.02.1995.

Böhme (1978) mentioned a reduced activity of adults during the dry season, the juveniles, however, being active just in this period. This annual activity pattern (temporal displacement) lead originally to the description of the juvenile as a separate species: *M. breviparietalis* Chabanaud (see Böhme l.c.). ZFMK 60683, from Bandiagara, is a hatchling fitting this pattern.

Mabuya quinquetaeniata complex

BF: ZFMK 38712-718 and 39029, Fada N'Gourma, H. Meier, 02.1982; Kafolo/Comoé, M.-O. Rödel, 11.06.1992, Korho and Daroha, near Bobo Dioulasso, M.-O. Rödel, 14.06.1992; M: ZFMK 57182-183, Kema Arrdt, Bandiagara, H. Meinig, 26.12.1993, Kita, H. Meinig, 11.01.1994.

Observed to be abundant in rocky environments in June by M.-O. Rödel, found to be rarer in December and January by H. Meinig in Mali, where, however, also the western

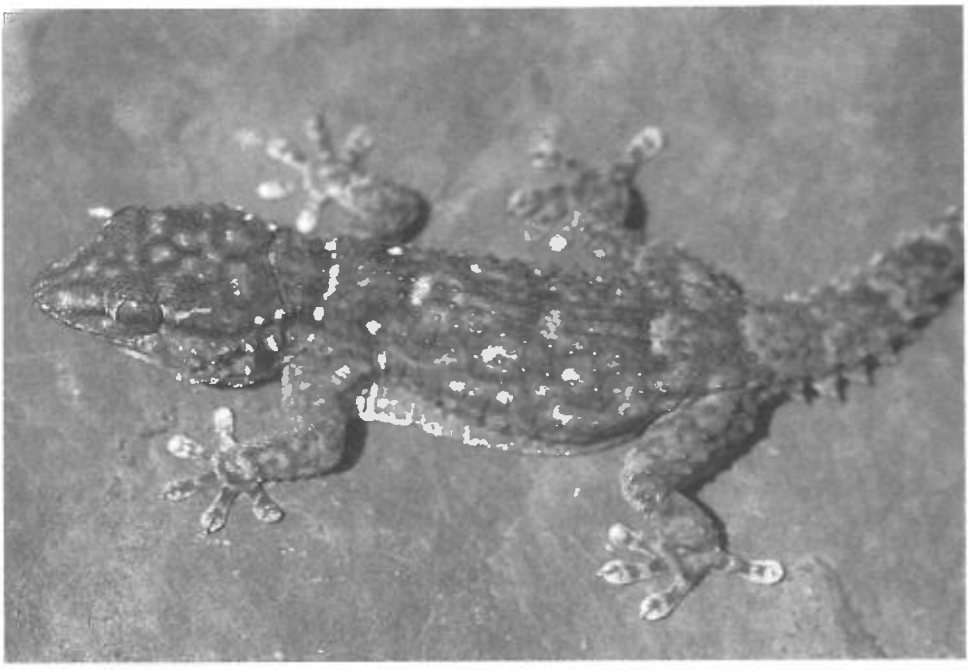

Plate 1. *Tarentola annularis* from Bandiagara, Mali (photograph by H. Meinig).

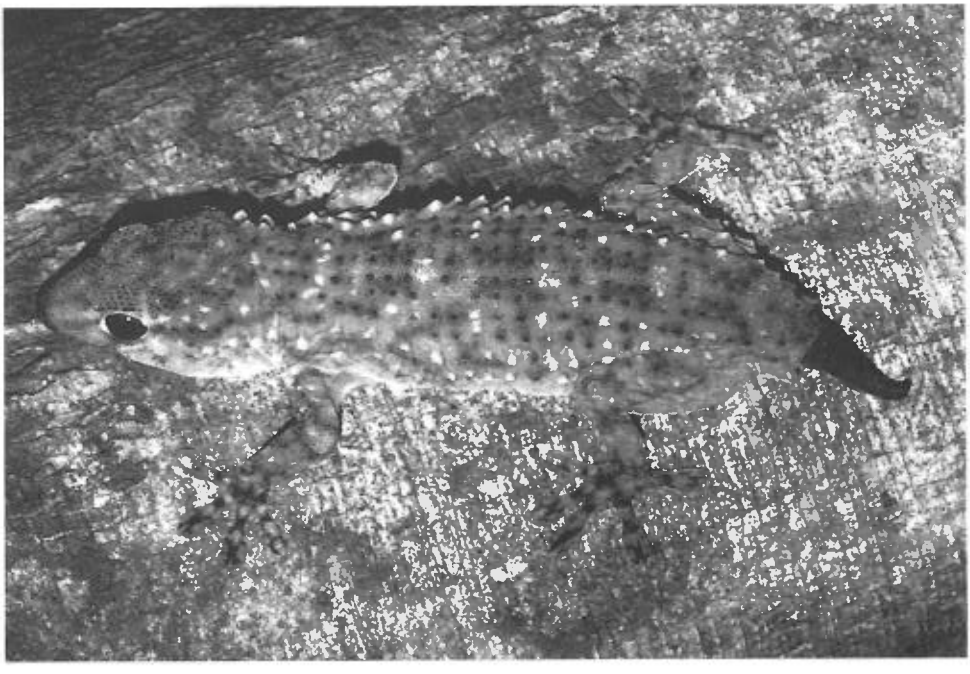

Plate 2. *Tarentola parvicarinata* from Bobo Dioulasso, Burkina Faso (photograph by M.-O. Rödel)

margin of its distribution area is situated. Böhme (1975) found two sibling forms of this complex in northern Cameroon, one of which can be identified with *M. (q.) scharica* Sternfeld, whereas the other one may correspond to *M. (q.) langheldi* Sternfeld. The above-listed vouchers fit the phenotype of *scharica,* but a thorough taxonomic revision of this species complex, which is so widely distributed in Africa, is highly warranted.

Lacertidae

Acanthodactylus guineensis (Boulenger, 1887)

BF: ZFMK 38720 and 39028, Fada N'Gourma, H. Meier, 02.1982; ZFMK 59511, Daroha near Bobo Dioulasso, M.-O. Rödel, 14.06.1992; M: ZFMK 57176, Bandiagara, H. Meinig, 23.12.1993.

In his revision of the genus *Acanthodactylus*, to which Salvador (1982) transferred this species from its original generic allocation *Eremias*, he gave also a complete list of its distributional records known to him. These were restricted to Nigeria and Ghana. He overlooked, however, *Eremias benueensis* Monard from Cameroon which is clearly a synonym of this species, thus extending the distribution eastwards to the latter country. Our records listed above are the first ones west of Ghana, consequently also the first ones for both Burkina Faso and Mali. A first tentative morphometric comparison indicated slight differences in pholidosis of the Malian and Burkina Faso specimens as compared with the values given by Salvador (l.c.). The sample size, however, is still too small to corroborate such differences. Two of us (W.B. & H.M.) are therefore preparing a taxonomic revision of all available material covering the entire species range. The Malian specimen, a female (Plate 3), is distinguished from the Burkina Fasoan (Plate 4), Ghanaian and Nigerian material by a particularly pale colour pattern, which perfectly fits the colour of the light reddish sands of the banks of the river Yamé where it had been caught.

As to the reproductive cycle, M.-O. Rödel was able to observe a couple at Daroha in June during courtship at noon, trying to copulate. The species was at this locality associated with harder soil and even with rocky habitat structures.

Varanidae

Varanus exanthematicus (Bosc, 1792)

M: ZFMK 60685, Bandiagara, H. Meinig, 02.1995.

The Steppe Monitor was found to be widely distributed and not rare in Mali (Papenfuss 1969, Buffrénil 1993). In the area of Bandiagara, one specimen (Plate 6) was caught - and released - at the banks of the river Yamé. The local people regularly eat this lizard, and dry, mummified heads, such as ZFMK 60685, can be found in many rubbish heaps, as well as in the shops of fetish-dealers.

Varanus niloticus (Linnaeus, 1766)

BF: Korho near Bobo Dioulasso, M.-O., Rödel, 14.06.1992.

Despite its wide distribution in the subsaharan savanna belt the Nile Monitor is not documented for Burkina Faso: "Aucune information, mais la présence ...est hautement

Plate 3. *Acanthodactylus guineensis* female from Bandiagara, Mali
(photograph by H. Meinig)

Plate 4. *Acanthodactylus guineensis* male from Daroha, Burkina Faso
(photograph by M.-O. Rödel)

Plate 5. Habitat of *Acanthodactylus guineensis* and of *Varanus exanthematicus* at Bandiagara, Mali (photograph by H. Meinig)

Plate 6. *Varanus exanthematicus* from Bandiagara, Mali (photograph by H. Meinig)

probable" (Buffrénil 1993). The above-listed record has, of course, not been collected, nevertheless it seems to represent the first concrete observation of this species in this country (see e.g. Mertens 1942, Papenfuss 1969, Buffrénil l.c., Ziegler & Böhme in prep.), As we do know records and voucher specimens from all adjacent countries around Burkina Faso (Mertens l.c., Papenfuss l.c., Buffrénil l.c., Ziegler & Böhme l.c.), the new record for the latter is not a faunistic surprise, but merely a simple problem of lacking information.

Leptotyphlopidae

Leptotyphlops bicolor (Jan, 1860)

BF: ZFMK 38721-722, Fada N'Gourma, H. Meier, 02.1982.

This species has already been recorded from Burkina Faso (Bobo Dioulasso, Garango: Papenfuss 1969; Hahn 1980, Hallermann & Rödel 1995).

Typhlopidae

Typhlops punctatus (Leach, 1819)

BF: ZFMK 38723, Fada N'Gourma, H. Meier, 02.1982.

According to Papenfuss (1969), Roux-Estève (1974) and Hahn (1980) this widespread species seemed to be unrecorded from Burkina Faso, it had, however, already been cited by Roman (1969) for that country. Our voucher has to be assigned to the nominotypic subspecies (Roux-Estève l.c., Hahn l.c.).

Boidae

Python sebae (Gmelin, 1789)

M: Bandiagara, H. Meinig, 02.1995.

An exuvia of this snake was found in Bandiagara.

Colubridae

Prosymna meleagris (Reinhardt, 1843)

BF: ZFMK 38726, Fada N'Gourma, H. Meier, 02.1982.

According to Broadley (1980), the savanicolous populations of this species have to be assigned to the subspecies *greigerti* Mocquard, the type locality of which is situated in Burkina Faso (Lobi region). There are several subsequent records from this country (Papenfuss: as *P. m. laurenti* ; Roman 1969, Broadley l.c.).

Dasypeltis fasciata (Smith, 1849)

BF: ZFMK 38729, Fada N'Gourma, H. Meier, 02.1982.

This specimen consists only of the head and the anterior part of the body. Light brown in colouration, with a pattern of ill-defined, pale brown spots, it resembles the specimen

from Garango, Burkina Faso, cited by Schätti (1986). It was placed to *D. scabra* by Villiers (1965) but Schätti (l.c.) when discussing his Malian material thought it more likely to represent also *D. fasciata*. Egg-eating snakes are widely distributed in Burkina Faso (Roman 1969).

Dromophis praeornatus (Schlegal, 1837)

BF: ZFMK 38724, Fada N'Gourma, H. Meier, 02.1982.

Mentioned already by Papenfuss (1969) with two localities in Burkina Faso (Dano, Garango).

Psammophis cf. *phillipsi* (Hallowell, 1844)

BF: ZFMK 38725, Fada N'Gourma, H. Meier, 02.1982; M: ZFMK 57175, between Ségou and Seward, 158 km SW Seward, H. Meinig, 22.12.1993; ZFMK 57187, between Seward and Mopti, H. Meinig, 31.12.1993; Djenné, H. Meinig, 3.01.1994; Bla, H, Meinig, 30.01.1995.

Former records of this snake have been listed under the name *P. sibilans* (e.g. Papenfuss 1969, Roman 1969). Böhme (1978) discussed the taxonomy of this difficult complex in West Africa and followed Broadley (1977) in considering *P. phillipsi* Hallowell as a valid, distinct species. He offered some evidence that the savanna populations are easily distinguishable from the form occurring the the rain forest. This view was accepted by Schätti (1986). A thorough revisionary work by Brandstätter (1995) to be published soon corroborated the fact that *P. sibilans* does actually not occur in West Africa. Furthermore he could demonstrate that the forest (i.e. *phillipsi* sensu stricto) and the savanna forms in West Africa are taxonomically distinct, and that the savanna forms require recognition as a distinct taxon (Brandstätter in prep.). Our voucher material agrees very well with the last mentioned form, which is characterised by a striking juvenile pattern (Plate 7) which is successively reduced during ontogeny. Most subadults and younger adults show a very characteristic pair of orange-yellowish dorsolateral stripes which represent traces of the juvenile dress. Another typical feature is a brownish or reddish spotting of the supralabial shields (Plates 7 & 8) (see also Schätti's comment on his Malian specimens). It may be added here that *P.* cf. *sibilans* sensu Rödel *et al.* (1995a) from the Comoé National Park, Ivory Coast, has also to be assigned to the savanna form of *P. phillipsi*, which seems to occur there in syntopy with the typical forest-dwelling *P. phillipsi*.

This snake shows a great ecological plasticity. In Mali, it was found in cultivated areas (onion fields at Bandiagara, rice fields between Seward and Mopti) as well as in the thornbush savanna (between Segou and Seward). The specimen from Djenné (not preserved) was found dead on a road near the market place, in the centre of the city.

Elapidae

Elapsoidea semiannulata (Bocage, 1882)

BF: ZFMK 38727-728, Fada N'Gourma, H. Meier, 02.1982.

Rödel *et al.* (1995a) refer to two different types of colour pattern in the West African populations which are currently referred to the subspecies *moebiusi* Werner, 1897. In

Plate 7. *Psammophis* cf. *phillipsi* from between Ségou and Séwaré, Mali, showing still the juvenile colour pattern (photograph H. Meinig)

Plate 8. *Psammophis* cf. *phillipsi* from Bla, Mali, showing already the unicoloured adult dress (photograph by H. Meinig)

contrast to specimens figured by Roman (1969, 1976), Villiers (1975), and Gruschwitz *et al.* (1991) they documented a pattern consisting of black and brownish-grey bands, separated by narrow white stripes. Interestingly, our two specimens, both being juveniles, represent also these two different colour pattern types, ZFMK 38727 showing the first, and 38728 the second type. This argues against an age-dependant variation as suggested by Roman (1976). More material has to clarify this unusual variability and possible taxonomic implications. Generally, *E. semiannulata* is widely distributed in Burkina Faso, as shown by Roman (1969) who, in this first paper published by him, assigned it still to *E. guentheri* .

Naja melanoleuca (Hallowell, 1857)

BF: Korho near Bobo Dioulasso, M.-O. Rödel, 14.06.1992.

According to Roman (1969) this species is restricted to the southwestern portion of Burkina Faso, from where also our observation originates.

Viperidae

Bitis arietans (Merrem, 1820)

M: Bla and between Bla and Bandiagara, 158 km S Seware, H. Meinig, 22.12.1993.

Sloughed skins of the puff adder have been found in a cultivated field (Bla) and in thornbush savanna (between Bla and Bandiagara). Schätti (1986) reported this species from Kokungru, where he found a specimen in a peanut field.

FAUNISTIC AND ZOOGEOGRAPHICAL CONCLUSIONS

A comparison of the 42 species of amphibians (16) and reptiles (26) recorded from Burkina Faso and Mali in this paper reflects the extremely different state of knowledge of the herpetofauna in these two countries. For Mali, only one additional frog species (*Phrynobatrachus* sp.) can be added to the faunal list, its specific identity, however, remaining unclear due to its juvenile status; it is only clear that it is none of three species already recorded from Mali. Likewise, only one reptile species can be added to the Malian faunal list through this paper, viz. *Acanthodactylus guineensis* . This lizard is also unknown so far from Burkina Faso, having been collected before only in Ghana, Nigeria and Cameroon. Similarly, the likewise West African endemics *Agama sankaranica* and *Tarentola parvicarinata* were definitely not known from Burkina Faso before. However, also some particularly wide-ranging reptile species like *Chamaeleo senegalensis, Mabuya affinis* and *Varanus niloticus* had, although to be expected with great likelihood, not specifically been recorded from this country! In some instances such as *Bufo pentoni, Hylarana galamensis, Ptychadena maccarthyensis,* and *Hemisus marmoratus* the same may be true, because their vast distribution areas are mostly described in a very general way as e.g. "from Senegal to Ethiopia" or so. In rarer species, however, the published information on their areas of distribution is usually much more precise, therefore, we can explicitly add *Silurana tropicalis, Ptychadena schubotzi, Afrixalus vittiger* and *Kassina fusca* to the faunal list of Burkina Faso. In contrast to frogs and lizards the snake fauna of this country has been surveyed particularly thoroughly, due to the activities of the resident ophidiologist B. Roman in Ouagadougou. However, the state of knowledge in Mali is worse.

As can be seen from the results of the few and short missions reported on here, the discovery of several additional amphibian and reptile species has to be expected in both Mali and Burkina Faso when the faunistic surveying will be intensified. Also the discovery of new taxa is well possible due to the fact that this region represents also an area of endemism. Remarkable and of particular historical-biogeographical importance is the first discovery of forest species *(Silurana tropicalis, Mabuya affinis)* so far inland in arid West Africa as Burkina Faso. They elucidate the role of gallery forests as relict sites (possibly also as dispersal pathways?) and may be an indication that the forest fauna relicts are disappearing more slowly than the forest itself.

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NOTE ADDED IN PROOF

In the light of some new findings the Burkina Fasoan records of *Phrynobatrachus francisci* and *P. natalensis* are now regarded *P.* c.f. *latifrons* Ahl.1924 and *P.* c.f. *francisci* (Boulenger, 1912) respectively. For discussion see Rödel, M.-O. (in press): *Amphibien der westafrikanischen Savanne.* Edition Chimaira, Frankfurt/M. 300 pp.

CONTRIBUTION TO THE KNOWLEDGE OF THE GAMBIAN HERPETOFAUNA

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ABSTRACT

During two short visits to the Gambia (08/91 and 07/93), under the auspices of the Herpetological Service at the Musée Royal d'Afrique Centrale, Tervuren, 21 reptiles and 26 adult amphibians were collected. For some species previously unknown from the Gambia these provide physical evidence for their occurrence. The first *Amblyodipsas (Calamelaps) unicolor* for the Gambia is recorded. The collections also provide a good series of the rarely collected Amphisbenid-species *Cynisca feae*, showing a large variation in head-scaling.

INTRODUCTION

Rochebrune (1884) in his work dealing with the fauna of the 'Sénégambie' made a first attempt to list the herpetofauna of the region. The first documented list however, was published by Andersson (1937), and contained only 2 crocodiles, 3 turtles, 8 lizards, 15 snakes and 4 amphibian species. Håkansson (1981) reported a total of 39 species of reptiles. However, no collection sources were indicated and therefore most of the determinations cannot be verified. He also added a list of 21 species he expected to occur in the Gambia, hence admitting that a more profound herpetological exploration of the area was badly needed.

Gruschwitz, Lenz & Böhme (December, 1991) made up a list with 40 amphibian and reptile species for the Gambia. Their list is supported by photographic evidence but only limited collection material (deposited in the Museum Alexander Koenig in Bonn). They record for the "first time" in the Gambia, 3 species of amphibians and 8 species of reptiles. However, '*Graya silurophaga*' (for *Grayia smithii*) and '*Dactylethra calcaratus*' (for *Xenopus tropicalis*) were already listed by Rochebrune (1884) for 'Gambie' and *Dispholidus typus* from Albreda (in Gambia). Also, two species (*Telescopus variegatus* and *Elapsoidea semiannulata*) they found to be new for the list of Gambian terrestrial reptiles, were not even listed in the "expectation"-list of Håkansson. Only the additional amphibian species and only two snakes were documented by collection material (fortunately the two 'unexpected' species). The authors announced some new discoveries for the Gambia.

Some additional documentation for the herpetofauna of the Gambia and overlooked by some authors is found in Gans (1987) who records *Cynisca feae*, in Hughes (1983) for *Grayia tholloni*, and in Chabanaud (1917) who mentions *Echis carinatus* collected at Guenoto (specimen at the MNHNP, apparently lost -A. Ohler, pers. comm.). Jones (1991) claims to list 8 new records for the Gambia but in reality he only adds 3 species: *Atractaspis aterrima* and *Atractaspis dahomeyensis*, (although the known *Atractaspis irregularis* is not listed) and *Elapsoidea semiannulata moebiusi*. Jones *et al* (1990), Stossl (1993), Moiser & Barber (1994) and Starin & Burghardt (1992), dealing with the Gambian herpetofauna, do not add first records for the country.

For many species their occurrence in the Gambia has been deduced from their presence in Senegal, for which many studies are available (Mertens, 1938; Grandison, 1956; Loveridge, 1956; Villiers, 1956; Condamin & Villiers, 1962; Lamotte, 1969; Cissé, 1974; Böhme, 1978; Miles, Thomson & Walters, 1978; Cissé & Karns, 1978; Joger, 1981, 1982). The herpetofauna of the Gambia itself remains very poorly documented. This is a deplorable situation if one considers its probable importance in the distribution limits of many West-African tropical forest species. Even for amphibians that are rather easy to collect, one can only guess the reason of their absence among faunistic studies (Schiøtz, 1969).

During two herpetological visits to the Gambia, in July 1991 and in July 1993, 21 reptiles and 26 adult amphibians were collected by one of us (O.P.), pertaining to 14 different species. Many tadpoles (298 specimens) were also collected, but these are not treated here.

NEW MATERIAL

All specimens are deposited at the Musée Royal d'Afrique Centrale, Tervuren, Belgium, they are indicated by their registration number.

Amphibia
Pipidae
Xenopus tropicalis
MRAC 93-092-B-13-15 : Lamin, 10/07/1993
MRAC 93-092-B-24-27 : Makumbaya, 11/07/1993

This species was first observed in the Gambia by Gruschwitz *et al.* (1991) at two localities (Abuko and Lamin). The specimens we report from Lamin, were found in one particular drinking hole for cattle. This site, in contrast with all the other water holes situated close to the mangrove, was not polluted by brackish water. At Makumbaya, the species was found in a natural pool near the forest.

This species was already known to occur in Senegal (de Rochebrune, 1884); however, Böhme (1978) provides the first 'certain' citation for Senegal.

Bufonidae
Bufo regularis
MRAC 93-092-B-9 : near Bakoteh, 09/07/1993 (juv)
MRAC 93-092-B-17 : Lamin, 10/07/1993

Ranidae
Ptychadena trinodis
MRAC 93-092-B-32 : Mandinaba, 18/07/1993

From this species many were gathered in a pond, filled by the first rains of the retarded rainy season, from 17 and 18/07. At an earlier visit at the same site (16/07) not even a single individual could be detected as the pond was still completely dried out.

After two days of mating activity many egg deposits were visible. These were clearly of two different types, which are very probably referrable to the two species found active in the neighbourhood: *Ptychadena trinodis* and *Phrynobatrachus francisci*.

Dicroglossus occipitalis

MRAC 93-092-B-1	: Bakoteh, 05/07/1993 (male)
MRAC 93-092-B-5	: Mandinaba, 08/07/1993 (female - holding many eggs)
MRAC 93-092-B-16	: Lamin, 10/07/1993
MRAC 93-092-B-18	: Makumbaya (1 km from Mandinari), 11/07/1993 (male)

Phrynobatrachus francisci

MRAC 92-007-B-1	: near Bakoteh, 14/08/1991
MRAC 93-092-B-2-4	: near Bakoteh, 6/07/1993
MRAC 93-092-B-6-8	: near Bakoteh, 9/07/1993
MRAC 93-092-B-29-31	: near Bakoteh, 16/07/1993
MRAC 93-092-B-33-34	: Mandinaba, 18/07/1933

One specimen from Mandinaba contained 7 rather large (8 mm long) termites (Isoptera, genus *Nasutitermes* - determination by Mr Ruelle 1995).

Reptilia
Chelonia
Cheloniidae

Lepidochelys olivacea
One dead specimen was found on the beach of Kololi, 07/1993. Many carapaces and bones from Cheloniidae were present in the large waste belt in the fishermen's village of Brufut (13/07/1993); the meat of the turtles is eaten; the carapaces, however, are only rarely proposed for sale to tourists. The fishermen often catch small individuals (of hatchling-size) within the Gambian coastal waters.

Lacertilia
Agamidae
Agama agama

MRAC 92-007-R-1	: near Bijilo Forest Park, 15/08/1991 (female)

A female in breeding colouration.
This species was present at all localities visited, often abundant, in dry environment as well as in humid forest.

Scincidae
Mabuya perrotetii

MRAC 92-007-R-2	: Abuko, 19/08/1991 (male)
MRAC 93-092-R-11	: Brikama, 12/07/1993

Mabuya affinis

MRAC 92-007-R-3	: near Bijilo Forest Park, 21/08/1991
MRAC 93-092-R-12-13	: Mandinaba, 18/07/1993

In contrast to our first visit to the Bijilo Forest Park (08/1991), when both *M. affinis* and *M. perrotetii* were visible in large numbers, we could only find few *M. affinis* during our second visit (07/1993). By this time, due to the late arrival of the rainy season, the forest vegetation was not as extensive. The density of *M. perrotetii* seemed not affected by the drier conditions as *M. perrotetii* is more resistant to drought and also inhabits open and

dry places, where *M. affinis* is not encountered. These observations agree with those of Gruschwitz *et al.* (1991a). Böhme (1978) states that adults of *M. perrotetii* aestivate during the dry season. Probably the Bijilo Forest Park population of *M. affinis* starts aestivating (but in less arid conditions).

Gekkonidae
Tarentola ephippiata
MRAC 92-007-R-5-6 : near Bakoteh, 21 and 22/08/1991
MRAC 93-092-R-7-8 : near Bakoteh, 8 and 9/07/1993

Hemidactylus brookii
MRAC 92-007-R-7 : near Bakoteh, 8/07/1993
MRAC 93-092-R-9-10 : near Bakoteh, 8 and 12/07/1993

Ophidia
Colubridae
Psammophis sibilans (cfr. *rukwae*)
MRAC 92-007-R-4 : near Bakoteh, 21/08/1991

Many observations in the Bijilo Forest Park, both in 1991 and 1993.
Total length: 345 mm; tail length: 101 mm; 1 + 162 ventrals; 98 sub-caudals; 13 scale rows at midbody.

Amblyodipsas (Calamelaps) unicolor
MRAC 93-092-R-6 : Makumbaya, 11/07/1993

This specimen was captured in primary forest in the leaf litter on the forest floor. Only a few metres away the same day an amphisbenid was found. It seems to be the first specimen of the species to be reported for the Gambia, and adds the northernmost point to the present distribution of this tropical forest species.
Total length: 365 mm; tail length: 32 mm; 3 + 193 ventrals; 25 sub-caudals; 17 scale rows at midbody.

Remark on *Grayia*:
The occurrence of *Grayia smithii* (for discussion on the scientific name, see Meirte, 1992: 113) in the Gambia, published by Gruschwitz *et al* (1991) as a first record was based upon their field observations. They refer for its presence in the Abuko-Reserve to the photograph published in Brewer (1985), showing a swimming snake with a colouration that can be attributed to *G. smithii*.

The species was already mentioned for the Gambia by de Rochebrune in 1884, as *Graya* (sic) *silurophaga* , a synonym of *Grayia smithii*, also without referring to supporting collection material. The presence of *G. tholloni* in the Gambia, on the other hand, is better documented: Hughes (1983: 327) states an "unpublished specimen in the British Museum, 1955, 1.4.70, from Kotu stream, south of Bathurst", verified by us. One should insist on the necessity of good collections in order to be able to verify the determinations, especially when first records of rare species are involved.

Remark on *Causus*:
Andersson (1937) mentions three specimens of *Causus rhombeatus* in his analysis of a collection from MacCarthy Island. In his checklist of reptiles of the Gambia, Håkansson (1981) refers to this citation, without noting that Andersson did not distinguish

C. rhombeatus from *C. maculatus*. Hughes' monograph on *Causus maculatus* (Hughes, 1977) attributes all specimens of *Causus* from the Gambia, including one from MacCarthy Island (although not from the Håkansson-Series), to *C. maculatus*. He states that only one species of *Causus* occurs in the Gambia (Hughes, 1977, 1983).

Amphisbaenia
Amphisbaenidae
Cynisca feae

MRAC 93-092-R-1	: Makumbaya (at 1 km from Mandinari), 11/07/1993
MRAC 93-092-R-2	: Brikama, 12/07/1993
MRAC 93-092-R-3	: Brufut, 13/07/1993
MRAC 93-092-R-4	: Kiti, 14/07/1993
MRAC 93-092-R-5	: Mandinaba, 18/07/1993

At the same locality as for MRAC 93-092-R-3 some remnants of sloughed skin were found.

All specimens were found in the same biotope, a few centimetres down the soft soil in the most covered and humid parts of the forest. One specimen (MRAC 93-092-R-5) and the sloughed skin were found in decomposing stumps of dead trees. In all collecting sites the abundance of earthworms was striking, as well as the astonishing resemblance of both worms and amphisbenids by their pink colour and the similar reaction when exposed. We agree with Gans (1987), that these animals are probably not as rare as their low numbers within collections suggest. It is more a question of looking in the right places.

The illustrations found in in the original description of *Cynisca feae* (Boulenger, 1905: 203) are too schematic, especially as the ventral view is concerned.

The head scaling of the five specimens corresponds nicely with the scheme given by Gans (1987: 35), as far as the ventral view is concerned. Dorsally the headscaling resembles more with the illustration in Condamin & Villiers (1962: 902 Fig. 1). The dorsal view illustrated in Gans (1987: 35) shows no fusion of the frontal-parietal with the occipital shields. In the five specimens presented here the fusion of frontal-parietal-occipital is complete (see Figure 1C). (For definition of scale-names, see Gans, 1987: 8).

Among this series the variation in post-supralabial arrangement is large:

MRAC 93-092-R-1:	two post-supralabials both left and right, with two additional small shields at the left side (see Figure 1A)
MRAC 93-092-R-2:	two post-supralabials both left and right
MRAC 93-092-R-3:	post-supralabials fused both left and right (see Figure 1B)
MRAC 93-092-R-4 & 5:	two post-supralabials left; post-supralabials fused right

All specimens present 6 preanal pores on 6 distinct scales (but on 5 scales in MRAC 93-092-R-1 which has the central preanal scales fused.
Other meristic data are given in Table 1.

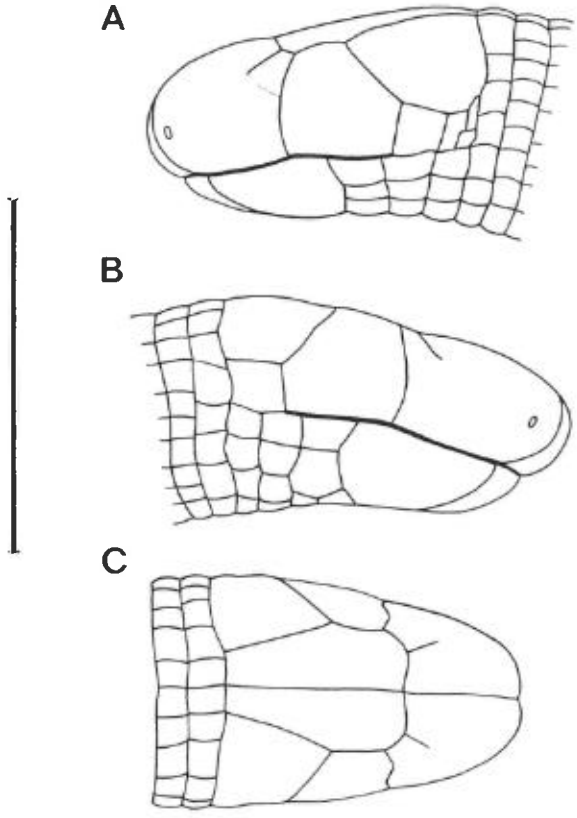

Fig. 1. Variation in head scalation in *Cynisca feae*. Scale bar represents 5 mm. A. Lateral view of the head of MRAC 93-092-R-1 (left side), showing the post-supralabial followed by two additional small shields. B. Lateral view of the head of MRAC 93-092-R-3 (right side), showing the fusion of the post-supralabial shields. C. Dorsal view of the head of MRAC 93-092-R-2, showing the fusion of the frontal, parietal and occipital shield.

Table 1. Measurements and scale counting for *Cynisca feae* specimens of the Gambia.

Specimen Number	body length (mm)	tail (mm)	approx. mid-body width (mm)	body annuli	tail annuli
MRAC 93-092-R-1	150	16	4	251	22
MRAC 93-092-R-2	156	16	4	260	22
MRAC 93-092-R-3	146	16	4	254	22
MRAC 93-092-R-4	152	15	4	256	21
MRAC 93-092-R-5	75	9	2.5	254	22

All specimens and the sloughed skin showed at midbody 14 dorsal and 9 ventral

segments, the latter including the central segment, in fact corresponding with the fusion of 2 segments (Boulenger, 1905; Laurent, 1947).

This small series illustrates the important variation in cephalic scaling found in the species (Gans, pers. comm.; Condamin & Villiers, 1962), a common situation found among burrowing reptiles.

Until now only two specimens were known from Gambia, both are presented by Gans (1987), apparently overlooked by Jones (1991) who indicates his listing of *Cynisca feae* for the Gambia as 'previously unrecorded from the Gambia'.

CONCLUSION

The collection presented here was made during two rather short visits and is only a small contribution to the study of the herpetofauna of the Gambia. Nevertheless an additional first record for the Gambia (*Amblyodipsas (Cala melaps) unicolor*) was detected. We hope that the richness of its nature can be documented and studied in the near future as deforestation and desertification are helping to eradicate species before their presence could even be confirmed.

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SOME NOTES ON THE REPTILE FAUNA OF FOURNOI, IKARIA, AND SCHINOUSSA, AEGEAN SEA, GREECE.

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INTRODUCTION

A trip to Greece in the early summer of 1995 gave me the opportunity to visit the islands of Fournois, Ikaria and Schinoussa. None of these islands have received much attention from herpetologist and relatively little has been published. This report is basically a summary of my field notes and I am withholding zoo-geographical discussions and topographical descriptions except where these are of direct relevance.

FOURNOI

This is a small archipelago of several islands which lies between and to the south of Ikaria and Samos. Only two of the group are inhabited; Fourni and Thymaina. Fourni itself is the largest island and it was here that I was based. Though the reptile fauna is related to that of the easternmost Aegean islands and hence to the Turkish mainland it is fairly impoverished. Conditions are dry, there is no surface water and the landscape is barren, almost treeless with scattered pockets of cultivation. Most searching was done from sunrise to around 09.00 hrs under sunny conditions with air shade temperatures between 26°C and 28°C. *Agama stellio daani* was found in small numbers in isolated populations living on stone walls and rocky outcrops. Population density was low as it was for *Tenuidactylus kotschyi beutleri* of which only a few examples were encountered in similar habitats. These were the only lizard species found although *Odphisops elegans macrodactylus* is listed (Ondrias, 1968; Chondropoulos, 1986) as well as *Ablepharus k. kitaibelli* (Wettstein, 1953; Chondropoulos, 1986). One specimen of *Eirenis m. modestus* was found active on a dusty track at around 08.00 hrs. This had a body length of 17 cm, tail 5 cm. What would appear to be the first documented record of *Coluber c. caspius* was made from two examples. One was found badly damaged on a steep path above the port and the other spotted basking on a rock on open hillside at about 09.00 hrs. This fled under some boulders when approached and could not be caught but was estimated at around 120 cm in length. The top of the head was reddish. In view of the wide distribution of this species and its presence on both Samos and Ikaria it was a not unexpected find.

IKARIA

The island of Ikaria is to be found roughly midway between Myconos (Cyclades) and Samos (Dodecanese). It is mountainous with peaks of over 1000 m and is well vegetated. A notable feature is the presence of abundant streams and small rivers which flow thoughout the year. In the neighbourhood of the mountain village of Christoare some lakes, which were not visited, and behind the shoreline swampy areas with deep ponds and pools. In addition to dense bushes and thickets along the stream margins there are conifer forests which have been partly destroyed by recent fires though not as severely as on some of the other Greek islands. Despite the habitat potential Ikaria does not boast

many reptile species though those that occur are quite common with an even distribution throughout the island. Like Fournoi the herpetofauna is of Asia Minor origin though a conspicuous absentee is *Eirenis modestus*. This was my third visit to the island. I am using information gathered in June 1966 and 1984 in addition to that assembled in 1995, June 21 to 24. On both previous occasions investigations were carried out in the vicinity of Agios Kirylos on the south coast and inland up to the central mountain ridge and eastwards to the extremity of the island near to Cape Drepanon. In 1995 I was based at Armenisti on the northside and towards the western end.

Agama stellio (Plate 1) was abundant and found not only on walls and rocks but on old buildings and earthy banks. It was active from sunrise through the hottest time of the day but was wary and difficult to approach. Several animals were often seen together.

Tenuidactylus kotschyi was found sporadically in 1995 but in 1966, June 3 to 7, it was more in evidence. *Ablepharus kitaibelli* was not seen at all in 1995 but three examples were found in 1966 in damp localities near streams and amongst low grassy vegetation.

Lacerta o. oertzeni (Plate 2) is also common on Ikaria. This dainty lizard was found along stream gullies where it occupied rocks and bouldes as well as roadside embankments and garden walls. It was much less in evidence in open dry countryside and the pine forests. This species was just as common at higher altitudes around 600-700 m as down by the coast.

O. elegans (Plate 3) was scarcer and in contrast to *L. oertzeni* preferred dry areas with low but not too dense vegetation, seeking cover around the base of plants and bushes and could occasionally be found on open sandy tracks. Unlike *L. oetzeni* it was a solitary lizard, shy and retiring and had to be looked for carefully.

Coluber caspius is the only snake species recorded from the island. In 1995 I found evidence of it only from a badly damaged specimen that had been dead a long time, but in 1966 three examples were found, two adults and a juvenile, and in 1984 a sub-adult on the top of the island on a path. From personal experience I would conclude that this snake is not common.

Whether other species exist on Ikaria is difficult to say. From talking to local people in 1966 I was assured that *N. natrix persa* occurred as well as a "viper". The existence of *N. natrix* must remain a possibility but although the streams and ponds were carefully examined I found no evidence to confirm this. If there are vipers on Ikaria then they would probably be *Vipera xanthina* but it is more likely that the snake referred to is *Telescopus fallax*. This species is never easy to find and if rare might well escape detection.

Mauremys caspica rivulata was found nearly everywhere. It occurred in large congregations in bodies of water behind the shoreline and in significantly smaller populations in streams. This tendency to prefer still to running water has been noted elsewhere in Greece: Thassos, Samothraki and Lemnos.

SCHINOUSSA

Schinoussa belongs to a group of small islands off the eastern side of Naxos often referred as the little Cyclades. Only in recent years have these islands become readily accessible by steamer and even now regular connections operate only in the summer months.

Plate 1. *Agama stellio*

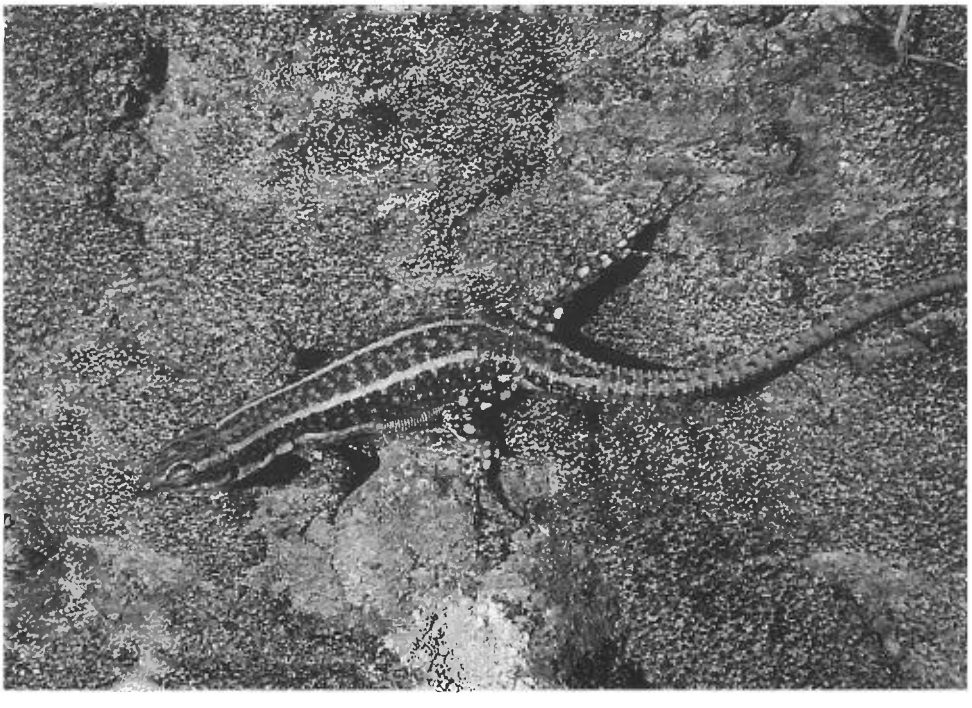

Plate 2. *Lacerta o. oertzeni*

Plate 3. ***Ophisops elegans***

I had hoped to make a more extensive trip to one or more of these in the Summer of 1995 but connections were made difficult by ferry strikes and then unusually strong winds which meant that only Schinoussa was visited and then for less than 48 hours. Interesting observations were made in 1971 and 1972 by Hans Lotze (Lotze, 1973) amongst which the first record of *Elaphe quatuorlineata muenteri* on Iraklea. In the same paper Lotze postulated that this snake also existed on Schinoussa on the basis of local reports but did not find any evidence of it. David Buttle visited Schinoussa in the latter part of June 1993. Buttle (1993) states that according to information he received the local people are unfamiliar with this species. I was therefore pleased to come across a subadult specimen which had recently been killed. Although the snake had started to decompose I was able to save it by preserving it in two changes of 45% ouzo and then despatching the specimen to Achilles Dimitropoulos at the Goulandris Natural History Museum at Kifissia. The dorsum was grey/brown with cinnamon cross bars an the dark body striping well under development but not continuous. The colouring and markings were similar to those to a subadult female caught on the island Amorgos in April 1993 (Clark, 1994) which measured 70.8 cm total length, 58.5 cm body length. The Schinoussa snake had a total length of 58.5 cm, body length 48.5 cm. Dorsal scalation was 24, 25, 22, ventrals 198, but with the first few uncountable due to damage, making the total count a few scales higher there were 61 paired subcaudals. Schinoussa is an island of 8.83 km^2 with a maximum elevation of 134 m. Walking was easy and being based at the island capital of Kastro I was able to cover most of the island easily in the time at my disposal. Day temperatures were well over 30°C on July 5 and 6. Numerous sheaves of wheat and barley were overturned and searching was also done at night.

Podarcis erhardii naxensis and *Tenuidactylus kotschyi* were the only other reptiles found. On the large dune area at Psili Ammos were found snake tracks which presumably had been made by *Eryx jaculus turcicus*. Schinoussa lacks streams or surface water though there are a number of deep wells. Wheat, barley and olives are the main crops and there are broad areas of natural scrub. Many fields are enclosed for the grazing of sheep, goats and cattle. The only other reptile that is known to inhabit Schinoussa is *Hemidactylus t. turcicus*.

TAXONOMY

In recent years some major changes have been made to reptile nomenclature. The generic, specific and subspecific designations given in this report are largely those that appear in Chondropoulos 1986 and 1989. In my opinion a number of the alterations have been capricious and arbitrary and not least confusing. Since Wettstein wrote his monumentous monograph on Aegean herpetology in 1953, the genus *Gymnodactylus* has been changed to *Cyrtodactylus, Tenuidactylus* and *Cyrtopodion*. The purposes that such changes serve seem unclear. I take no sides in the various debates and give the scientific names in accordance with the latest information I have to hand. The reader's attention is drawn to an important work by Eiselt and Schmidtler (1986) on the *Lacerta danfordi* complex which is of relevance concerning the lacertid rock lizards on Ikaria.

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