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THE BRITISH HERPETOLOGICAL SOCIETY

BULLETIN

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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 and 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 fulfill 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
All adult subscriptions become due on the first day of January each year. Payment by Banker's Order is much preferred.

Ordinary Members	£20	(Receive Bulletin only)
Full Members	£25	(Receive Bulletin and Journal)
Family Members	£30/£37.50	(Without/with Journal) Family members with children also receive the YHC Newsletter
Student Members	£18	(Receive Bulletin and Journal)
Institutional rates	£36	(Receive Bulletin and Journal)
YHC (Age 9-18):		
Basic Membership	£5	(Receive YHC Newsletter)
Bulletin Membership	£10	(Receive Newsletter and Bulletin)
Group Membership	–	For Schools, Youth Groups etc. Contact Education Officer (Address on inside of back cover) for details)

Correspondence, Membership applications, subscription renewals and purchase orders for publications should be addressed to the Secretary (address as at page top) EXCEPT for YHC matters. YHC Membership and renewal details are available from the Education Officer (address on inside of back cover). PLEASE INCLUDE A STAMP-ADDRESSED ENVELOPE WHEN WRITING TO THE SOCIETY.

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
John Pickett and Simon Townson.
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FRONT COVER
Adult male Argentine Black and White Tegu, *Tupinambis teguixin* – see *The Reproduction in Captivity of the Argentine Black and White Tegu*, by Bert Langerwerf, p. 18.
photo: Stephen Peltz

BRITISH HERPETOLOGICAL SOCIETY MEETINGS FOR 1993

All Members are welcome to attend the meetings outlined below, further details of which will appear n the Bulletin in due course. Reserve these dates in your diary!

March 20th	ANNUAL GENERAL MEETING, Birkbeck College London, WC1. 10.30-16.30. Details on separate notice.
April 4th	LEAPERS AND CREEPERS DAY. Joint BHS/Surrey Amphibian and Reptile Group Open Day. Nower Wood Nature Reserve (on B2033, Headley – Leatherhead road, map ref: TQ 194546. A day of talks, pond dipping, guided walks and other herpetological activities for all the family. 10.00 am to 5.00 pm.
May 1st	JOINT CONSERVATION/EDUCATION COMMITTEE MEETING, Brenscombe Farm, Corfe Castle, Dorset. Tours of three important reptile nature reserves guided by local experts.
May 14th	NEW DENHAM COMMUNITY CENTRE, Oxford Road, New Denham, Uxbridge (nearest Underground Station Uxbridge, approx. 10 min. walk). 8.00-11.00 pm. Outdoor Reptiliaries for breeding Lizards and Amphibians, by CHRIS DAVIES, followed by Cheese and Wine Evening.
July 3rd	Birkbeck College, Malet Street, London WC1. 2.30-5.30 pm. Vet Mark Geach will give a talk on the veterinary aspects of acclimatising and caring for wild caught and captive bred animals – advice on controlling parasitic burdens in reptiles and amphibians, dietary requirements, reducing stress, microscope use, etc.
September 25th	Birkbeck College, London WC1. 2.30-5.30 pm. HENK ZWARTEPOORTR, Curator of Reptiles at Rotterdam Zoo, on Breeding Reptiles and Amphibians in captivity.
October 16th	Birkbeck College, London WC1. 2.30-5.30 pm. Three talks: Long-term studies: the role of the amateur in herpetology, by LEIGH GILLETT. Round Island's reptiles under new management, by DAVID BULLOCK. The thermal ecology of lacertid lizards, by ROGER MEEK.
October 31st or November 7th	CAPTIVE BREEDING COMMITTEE OPEN MEETING. Details to be announced.
December 4th	RESEARCH COMMITTEE MEETING Details to be announced.

NORTH-WEST REGIONAL GROUP MEETINGS, 1993

January 26th	AGM and extra speaker (to be decided).
March 30th	Speaker to be announced.
June 1st	Joint meeting with YHC: "Animal Encounters".
August 7-8th	Reptile Rally.
October 2nd	National Seminar, with multiple. Speakers details to follow.
December 7th	Christmas Social Meeting

All sessions at the Wildford and Wetlands Trust Reserve, Martin Mere, and all except the Reptile Rally and National Seminar will be 8-10 pm.

OBITUARY

MR STEVE NORRIE

It was with great sadness that I was told of the death of Steve Norrie in a diving accident, one of his many interests, off the coast of Brighton. Steve was a long standing and loyal member of the B.H.S. always an enthusiastic and cheerful herpetologist with a love of nature. I first met Steve at a B.H.S. meeting in 1982, and in the ten years that I knew him, he was always helpful and generous with his knowledge and time.

Steve wrote several articles for the *Bulletin* such as Breeding Lilfords Wall Lizard, *Podarcis lilfordi,* in captivity and co-authored with B Langerwerf an article for the 1986 Proceedings of The British Herpetological Society Symposium on Captive Breeding.

For those who knew Steve, he was a very successful snake breeder, regularly producing such species as Indigo snakes, Blairs Kings, Rosy Boas, Brazilian Rainbow Boas, Carpet Pythons as well as many other colubrid species too numerous to mention.

His collection of animals were kept in beautifully clean and well designed cages. One could not help but be impressed by the aesthetically pleasing yet functional, simple layouts.

It was obvious by the packed church where Steve's memorial service was held that he was well thought of in all aspects of his working and spare time activities. The company that he worked for had closed down for the day to pay tribute to him. There were also many friends and colleagues from his diving and herpetological connections.

Steve left a wife Wendy, daughters, Emma and Lisa and a son Mark. It is hoped Mark will continue in his father's herpetological interests, as he has decided to keep and maintain the collection. The *Bulletin* will continue to be sent to Mark for another 2 years, by which time it is hoped he will be in a position to choose to become a full member in his own right. Our sympathies go to Wendy and family.

T. Thatcher

THE BRITISH HERPETOLOGICAL SOCIETY CONSERVATION COMMITTEE

REPORT FOR THE YEAR 1991

During 1991 the Conservation Committee continued to work closely with the Herpetological Conservation Trust (HCT) to improve the status of our reptiles and amphibians. The HCT was founded in 1988 to raise and channel funds into herpetological conservation. The HCT does not have a membership and works in close collaboration with the Conservation Committee. This arrangvement has resulted in improved funding for herpetological conservation. As an example of this close relationship, two experienced members of the Conservation Committee, Peter Reynolds and Mike Preston, became employees of the Trust. While we have achieved a lot with a largely voluntary work force, the employment of these professional herpetologists will greatly increase the amount of conservation work we can undertake.

The most memorable event was the intervention of Michael Heseltine, following legal action by the BHS and WWF, to save an important rare reptile site on Canford Heath. European outrage had resulted in the Department of the Environment revoking the decision of the Judicial Review to grant Poole Borough Council planning permission to build houses on this 17 acre site. BHS members may have read that Poole Borough Council had the right to appeal against this decision, but increased public awareness and support, together with the general election, resulted in no further challenge from the Council. After this case, guidelines given by the DoE to local authorities over nature conservation issues were stengthened.

Another important event was the purchase of a 4 acre heathland site near Frensham, Surrey in June 1991. This is an important and valuable site, being one of the few Surrey sites that supports indigenous Sand Lizards. This could not have been possible without generous grant aid from the NCC (now English Nature) and the generosity of certain BHS members.

Monitoring

As in previous years the monitoring of rare reptile and amphibians sites was given a high priority. Sand Lizards appeared to have a successful breeding season, despite a cold start to the summer, which delayed egg laying by some females until the first week in July. This was followed by a long hot spell which rectified the situation and it is pleasing to report that there were numerous sitings of Sand Lizard hatchlings.

Natterjack Toads had a rather poor breeding season due to another dry year. However at the BHS reserve at Sellafield and at a Ravenglass site, thousands of toadlets emerged. Conservation work at these two sites carried out by members of the Young Herpetologists Club ensured the toadlets' survival. Another positive sign was the callinng of Natterjack Toads in Dorset after a BHS introduction attempt. It is hoped that females will continue to spawn here in 1992.

The Natterjack site register was updated for all British sites and the English Nature Natterjack Recovery programme contracted Dr T. Beebee to establish priorities for safeguarding existing sites and making new translocations.

Management

Using the expertise of BHS volunteers, HCT co-ordinated a Heathland Management Programme. This gave priority to sites which were subject to invasion by mature and young pine, birch, scrub and gorse. These species compete with and shade out the heathland flora, making the habitat unsuitable for rare reptiles. The 1991 programme cleared 17 hectares of invasive vegetation involving 314 days of volunteer work. This is comparable with the 1990 management statistics and continues to reflect the fact that the more established the invasive vegetation, the more volunteer days needed to clear it.

Bracken continued to dominate a lot of Dorset and Hampshire heathland sites and can only be effectively irradicated using the selective herbicide Asulox. During 1991, 18 sites were sprayed with 400 litres of asulox taking 420 working days. This work was carried out by Conservation committee members under contract to the HCT.

Translocations and Captive Breeding
Natterjack Toads were introduced to three sites in 1991 and will be regularly monitored to see if these introductions are successful.

Sand Lizards from the captive breeding programme, together with Sand Lizards and Smooth Snakes rescued from doomed sites in Dorset, were released at a total of 4 sites in the Weald, in accordance with the NCC regional strategy. Subsequent monitoring has shown natural recruitment is taking place as in previous release programmes.

Publications
The booklets 'Save our Reptiles' and 'Garden Ponds as Amphibian Sanctuaries' were revised with colour photographs thanks to grant aid from the NCC. These new style booklets together with the 'Save our Reptiles' booklet ccontinued to promote practical herpetological conservation. A leaflet advertising the Land Fund was in the final stages of preparation. This will be a free hand-out designed to encourage donations to the Land Fund for printing costs had been gratefully received from English Nature and the HCT.

The Land Fund
This continued to accumulate, although more slowly than in recent years, due possibly to the state of the economy. Donations for 1991 totalled £4419.24, boosting the capital of £22,625 by December 1990. Interest on the account generated £1684.35 and was used to contribute towards the legal costs for tghe Surrey site purchase. We are particularly grateful to our friends in ASRA for a donation of £500 and to Bristol Zoo, which donated the coins collected from the crocodile pit, totalling £100.

Funding
Total income for the year 1991 was £34,299. Sources for this income included HCT (72%), Contracts (10%), Donations to the Land Fund (13%) and Interest from the Land Fund (5%).

Contracts for rare reptile translocations were obtained from Alath Construction Ltd and Hampshire County Council.

The HCT increased the level of funding, due to the fact that two thirds of this was funded by English Nature, the Worldwide Fund for Nature and the Vincent Wildlife Trust. This arrangements has reduced the workload of the committee, and has enabled us to concentrate on surveying, scientific research and management. We are very grateful or all financial contributions, both large and small.

Conservation Committee Membership 1991.
Mr B. Banks, Ms M. and Dr T. Beebee, Mr D. Bird, Mr A. Braithwaite, Mr J. Buckley, Mr D. and Mrs M. Dolton, Mr P. Edgar, M C. Fitzsimmons, Mr J. Gaughan, Dr R. Griffiths, Ms E. and Prof. GF. Haselwood, Mr H. Inns, Mr M. Jones, Mr M. and Mrs A. Langford, Mr D. Mills, Mr M. Preston, Mr D. Race, Mr P. Reynolds, Mr K. Sherrard, Mr E. Wade, Mr J. Webster, Mr W. Whitaker (Chairman)

We are grateful to the following individuals who have acted as advisors to the committee: Dr H. Arnold (Institute of Terestrial Ecology), Mrs J. Clemons (ASRA), Dr A. Cooke (English Nature), Mr K. Corbett (HCT), Dr A. Gent (English Nature), Dr M. Swan (Leicester Polytechnic), Dr C. Tydeman (WWF), Mr J. White (English Nature).

Acknowledgements
We are grateful to the following individuals and organisations who have made donations to the Land Fund during 1991:

ASRA, Dr Baksh, Mr B. Banks, E.A. Beausire, Dr T. Beebee, Mr D. Bird, M and S.K. Bosher, Mr T. Braithwaite, Bristol Zoo, Mrs S.J. Brooke, J. Buckley, P. Buckley, Miss Campbell, Jan Clemons, C. Cummins, D.T. Eastwood, C. Fitzsimmons, Julian and Phillippa Francis, Nicholas Fry. Mr J. Gaughan, Mrs M. Green, Dr R. Griffiths, C. Hall, G and E Haslewood, Miss C.A. Howes, Mr H. Inns, Mr Lock, L. Love, H. Lynes, Marwell Zoo, George McCarthy, Mr D. Mills, John Moon, Martin Noble, Lord Parmoor, Mr M. Preston, Reptile Watch, Mr P. Reynolds, Michelle and Martin Shaw, Miss S.R. Stebbing, Tenterden Trust, R. Turner, Toads on Roads 1991, Mr W. Whitaker.

THE COLONISATION BY GREAT CRESTED NEWTS *(TRITURUS CRISTATUS)* OF A WATER BODY FOLLOWING TREATMENT WITH A PISCICIDE TO REMOVE A LARGE POPULATION OF STICKLEBACKS *(GASTEROSTEUS ACULEATUS)*

ALISTAIR G MCLEE and ROB W SCAIFE

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INTRODUCTION

Predation of new larvae occurs at all stages of their obligate aquatic phase. Invertebrate predators include the adults and larvae of diving beetles (Dytiscidea) and the nymphs of dragonflies (Ansioptera), whilst a wide range of vertebrates will also take newt larvae. Such predators range from fish, adult newts themselves to aquatic birds (Frazer 1983). The impact of such predation will depend upon various factors eg the numbers of predators, the availability of alternative prey, density of submerged plants for cover, time of the year, etc.

The effects of a large population of fish upon the reproductive success of newts has been reported together with the observation that larvae of Smooth Newts *(Triturus vulgaris)* are less susceptable to fish predation than the larvae of Great Crested Newts. It has been suggested that the tendency of the larvae of Great Crested Newts to swim in more open water renders them more vulnerable to fish predation. It has been often observed that the introduction of fish species, for example Three Spined Stickleback, to waters in which Great Crested Newts breed, will eventually eliminate this amphibian, by the prevention of sufficient recruitment to the adult population (Cooke & Frazer, 1976; Beebee, 1980; Banks & Laverick, 1986; Bell, 1970).

Great Crested Newts are as a result, found in waters which naturally have no fish present, or where fish are unable to predate effectively due to vegetation, or those ponds where persistant fish populations are eradicated by the periodic drying up of the water body.

This paper describes an experiment in which a water body was treated with a piscicide to kill a large population of sticklebacks. The colonisation by Great Crested Newts was observed the same season.

LOCATION

The experimental site was a concrete tank with sloping walls of external dimensions 8m by 13m, having an average water depth of 0.90m. The only source of water was from precipitation. The tank was one of five sunk to ground level in a wooded nature reserve belonging to British Chrome and Chemicals Ltd, of Harcross Chemicals, Urlay Nook, near Yarm in County Cleveland, England. During the Second World War the area was an airfield and the tanks were distributed across the site to serve as emergency sources of water in the event of fire. Today the site is some 12 hectares, of which 30% is covered with conifers, the remainder being scrub woodland and rough grass area. Great Crested and Smooth Newts together with Common Frogs *(Rana temporaria)* and Toads *(Bufo bufo)* breed on the site in the other water bodies. The experimental pond had a large population of sticklebacks present and only Common Toads use it as a breeding site. No aquatic plants were noted in the pond, which historically remained an opaque grey/green colour throughout the entire year.

The population of fish was estimated by the technique of Mark/Recapture (Lincoln Index). Sixty two fish were hand netted and marked by the removal of a dorsal spine. Only 2 marked individuals out of 82 were recaptured some 30 minutes later. Although the data were statistically invalid, it was estimated that a population of the order of 2000 to 3000 was present.

Formula $N = \frac{S_1 \times S_2}{R}$

where
N = total number of population
S_1 = first capture number
S_2 = second capture number
R = number of recaptures

NB 7-10% of S_1 need to be recaptured for reasonable accuracy

METHODOLOGY

The piscicide employed was a commercial formulation containing rotenone at a concentration of 5% w/v. Rotenone is a naturally occurring, organic compound found in the tissues of certain plants (Pharmaceutical Press, 1979; Reynolds, 1982). Under the name of "Derris" it has use as a horticultural insecticide, being sold at a concentration of 0.25% w/v. As a piscicide it has use in commercial fish farms to remove fish species prior to restocking; and in natural waters to remove coarse fish or trout, before restocking with juvenile game fish (Walker, 1975; Schnick, 1974).

Being a naturally synthesised molecule, it is biodegradable as well as being rendered inactive by alkaline pH, light, oxygen or adsorption onto particulates in water (Pharmaceutical Press, 1979; Reynolds, 1982; Tifa Square, 1991). Its attractiveness as a biocide is its rapid disappearance from the environment. Rotenone acts as a contact piscicide and when dispersed in water it is particularly, but not specifically, toxic to fish. The reason for the particular sensitivity of fish is possibly because they are active respirers with proportionally large semi-permable membranes across which water flows, ie gills. Clearly no piscicide is solely selective for fish even at low concentrations and some invertebrates would be affected. However this impact on the population is regarded as slight (Morrison, 1977). Against this effect one must consider the impact of the fish population itself upon invertebrate numbers and species diversity.

After consulting the commercial (Tifa Square, 1991) and scientific literature (Meadows, 1973; Burress, 1982; Chandler & Marking, 1982) it was decided to dose the compound so as to give a final concentration of 0.2 mg/l in the pond itself. This was done by measuring the water volume of the pond (66m) and adding an appropriate volume of Chem-fish Regular 5% Rotenone (the commercial formulation marketed by Tifa Square). In order to ensure uniform application of the chemical, the 5% formulation was dispersed in 3.0 l of tap water prior to being distributed over the pond surface using pressurised garden pesticide spraying equipment.

The application took place as a single event on 2/5/92 and the exercise took some 7 minutes to perform. The water temperature was 15°C and that of the air 11°C. Fish were not observable at the time.

RESULTS

Four days after the application some 20, large, dead sticklebacks were seen on the surface and removed. When an area of the bottom was dredge netted many smaller dead fish were noted.

The anticipated natural detoxification of the rotenone was confirmed seven days after application, when a sample of the water was removed and approximately 100 small toad tadpoles were added to it. After 2 days there had been no deaths and it was decided to restock the pond with toad tadpoles which had been previously translocated before spraying. They went on to grow and metamorphose normally that year.

Regular observations over the following months, showed no live fish to be visible and in fact adult Great Crested and Smooth Newts were seen in the now clear water. A variety

of submerged aquatic plants were introduced to enhance the pond's water quality and also to provide cover for any newt larvae which may have been developed from eggs laid earlier. In July of the same year, well developed newt larvae were observed and subsequently trapped and identified as Smooth and Great Crested.

CONCLUSION AND DISCUSSION

This simple study has shown that a small pond, heavily populated with sticklebacks, can, after treatment with a rotenone based piscicide, be colonised rapidly by Great Crested Newts from adjacent breeding sites. Although no studies were made of the effect of the addition of the chemical on the invertebrate population, these remained, recovered or recolonised and there was an adequate prey population sufficient to allow the development of newt larvae. Also large invertebrates such as adults of Great Diving Beetle were observed.

In any experiment it is difficult to prove the negative – in this case the total absence of sticklebacks, but the authors intend to continue to monitor the pond to see if a fish population re-establishes itself. The authors believe that this technique has potential for reclaiming Great Crested Newt breeding sites which have been lost as a result of the arrival of predatory fish species. Any decision to attempt to make a site once again suitable for newt breeding will depend upon various factors. One consideration certainly should be the method by which fish came to the pond in the first place. Was it a deliberate action by man, or a once off large flooding incident or regular flooding from a water with a fish population, etc? Also to be considered are all dimensions of a re-introductgion programme of newt species if natural recolonisation is deemed unlikely. Special consideration should be given to the suitability of terrestrial environment and the possibility of vandalism.

Piscicide applications to larger or physically more complicated water bodies than that described here, would require careful forethought and close attention to the supplier's application instruction for the piscicide. Furthermore, the deliberate addition of a piscicide to any water body in England and Wales requires the permission of the National Rivers Authority (NRA). Strict constraints and conditions concerning the application must be met (see Table 1 for a summary). The permission of the landowner must also be sought of course.

Ideally, the authors would have liked to have treated the water body earlier before adult amphibia (in this case – toads) had started to return to breed. Late February/early March would have been better. A further benefit of an early spring treatment is that there would be little chance of fish overwintering as eggs and so being relatively immune to this contact biocide.

The entire population of sticklebacks was not totally destroyed. Some 250 individuals were trapped before treatment and released in a nearby stream (Nelly Burdon's Beck) which had recently had its water quality improved and was now capable of supporting fish life.

ACKNOWLEDGEMENTS

The authors would like to thank the following organisations:

British Chrome & Chemicals Ltd, Urlay Nook, Eaglescliffe, Cleveland County, England, for permission as landowners of the nature reserve to conduct the trial, with special thanks to Mr Alf Makay.

National Rivers Authority, Northumbrian Region, Southern Area Office, Lingfield Way, Yarm Road Industrial Estate, Darlington, Co Durham, for permission to apply a piscicide to this water body and for their subsequent interest in the trial and its outcome.

TIFA (CI) Ltd, Unit 3, Forward Way, Laker Road, Airport Industrial Estate, Rochester, Kent, ME1 3QX, for supplying the sample of 1 l. of Chem-Fish Regular 5% Rotenone formulation and for useful technical advice.

TABLE 1

Salmon Freshwater Fisheries Act 1975 – Use of Noxious Substance. (Section 5(2))

Permission required from NRA and Ministry of Agriculture Fisheries and Food:– Information required.

Site Details

Name and address of individuals seeking permission
Name, location and grid reference of site
Area of water to be treated
Duration of treatment
Water static or flowing (volume flow rate)

Method of Application

Reason for choice of piscicide as opposed to other methods
Type, concentration and formulation of active component
How will it be applied to water
Previous experience with piscicide
Containment plans

Risk Assessment

Will water be used for human consumption?
Access of livestock to water before substance has disappeared
Effect on target species
Effect on species of conservation value eg. amphibians and scarce invertebrates

Public Liability

This rests solely with the applicant.

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A TECHNIQUE FOR MONITORING THE FINAL PHASE OF METAMORPHOSIS IN NEWTS

A S COOKE (1) and S D COOKE (2)

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(2) The Nottingham Trent University, Clifton Lane, Nottingham NG11 8NS

INTRODUCTION

Studying metamorphosis and emergence in newt populations can provide both basic ecological data and information of relevance to conservation eg on reproductive success. One field technique for monitoring emergence involves erecting plastic fences around breeding sites and catching metamorphs in pitfalls or other types of trap (eg. see van Gelder, 1973: Hagstrom, 1974; Harrison *et al*, 1983; Duff, 1989). However this technique needs a large time investment and may still fail to catch or hold all metamorphs (Duff, 1989). An alternative technique involves trapping or netting a sample of tadpoles in the pond itself and selecting and studying those that are close to emergence. One difficulty with newt tadpoles in this respect is that they acquire four legs relatively early during their aquatic phase and for much of their later development morphological changes are much more subtle than the obvious ones displayed by anuran larvae. We report here on a straightforward field technique that readily allows separation of larvae into early and late development stages.

THE WALKING STAGE

When netted, younger tadpoles, even at the four-legs stage, behave like fish; they generally lay on their sides and flap. However, their legs are evidently growing in strength and there comes a point in their development at which, when netted, tadpoles turn on their bellies and walk; such tadpoles we define as "walkers". A few seconds observation is usually all that is needed to decide whether or not a netted tadpole is a walker. In some samples, these may be in the majority (see below). Overwintering animals taken from November onwards are inclined to be sluggish and may not walk when netted, although they do right themselves onto their bellies.

For most of the walking stage, animals retain the typical larval skin colour and texture, and gill and fin size. But immediately before and after emergence these change (contrast drawings in Figure 1).

APPLICATIONS

Measurement of length. During summer and autumn, walkers may be caught in good numbers and their measurement can provide a constant sampling stage for comparison between populations in different ponds or between the same pond in diferent years. Thus in one particular netting area of the newt reserve at Stanground, Peterborough, mean number of Crested newt tadpoles *(Triturus cristatus)* caught per five minute sampling period during July and August was in 8 in 1992 (n = 4, standard error = 2), but 37 in 1991 (n = 4, SE = 2). The unusually high "density" in 1991 was reflected in a reduced mean length of walkers of 42 mm (n = 6, SE = 2), compared with 57 mm in 1992 (n = 7, SE = 2). The different in mean lengths between the two years was highly significant ($t_{11} = 6.16$, P 0.001).

Time of metamorphic climax. Sampling for walkers provides a method for determining when emergence occurs and allows comparison between species and between sites. Netting details from two sites are given in Table 1. At Woodwalton Fen in 20 small ponds (refer to Cooke *et al.* 1980 for details of the ponds), walkers occurred earlier for the Smooth Newt *(Triturus vulgaris)* than for the Crested Newt. However, the greatest number of walkers was recorded during the same netting session (25/26 August) for both species. Although netting did not

continue at Woodwalton until catches were zero, low numbers of non-walkers of both species were caught at the end of September.

At Stanground, Crested Newts appear to have had a short, concentrated period of emergence, with walkers only being caught on two occasions. For Crested Newts, walkers peaked earlier at Stanground than at Woodwalton Fen. At Stanground, peak numbers of breeding Crested Newts are typically recorded in March, which is unusually early for this area. Smooth newts may have overwintered as tadpoles, with walkers still being found when netting stopped in November.

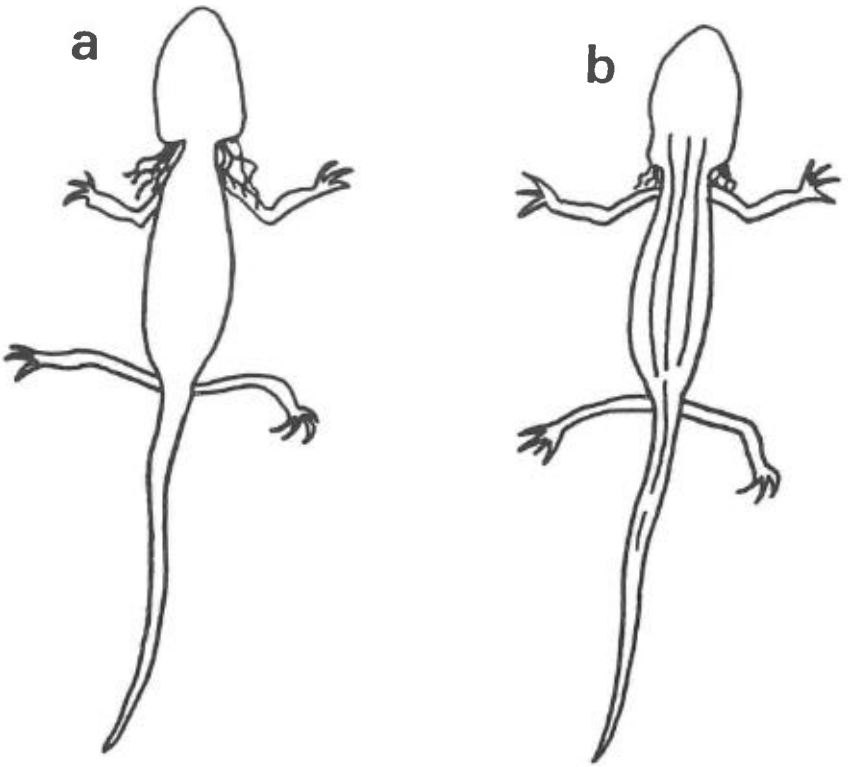

Fig. 1. Dorsal views of Smooth Newts *(Triturus vulgaris):* Fig 1a shows the typical walking tadpole;
Fig 1b represents an animal at emergence.

To test whether walkers emerge in (late) autumn, ten Smooth Newts at the walking stage were kept in a cage measuring 30 x 30 x 30 cm in a garden pond, their natal site. The experiment was run from 29 September till 14 November 1992 (pond temperature ranged 3-16°C). During that time five metamorphs emerged, the last being on 2 November. Thus the other five walkers remained in that state for 46 days without emerging. The duration of the walking phase at the height of the season remains to be determined.

Number of walkers. During specific periods, the number of walkers caught in a standardised manner may reflect the number of metamorphs that emerge. Thus at Woodwalton Fen, netting sessions took place at intervals of roughly two weeks; 216 Smooth Newt walkers were caught from mid July till the end of September and this total may be regarded as an index of emergence. A repeat of this catching regime in future years could reveal how those years compare for emerence with 1992. As the 20 ponds at Woodwalton are all the same size and shape it may be possible to compare catches of walkers between them, but it would be most unwise to compare two ponds where ability to catch tadpoles is likely to be different. Moreover, information from catches later than September should be treated with great caution as walkers may take longer to emerge and may indeed overwinter.

TABLE 1. Catches of walking and non-walking newt tadpoles at two breeding sites

Date	No. of ponds/ areas*	Total netting time (minutes)	Crested Newts			Smooth Newts		
			Total	Walkers	Non-wealkers	Total	Walkers	Non-walkers
Woodwalton Fen								
14.7.92	20	100	75	0	75	206	4	202
27/28.7.92	19	95	101	1	100	152	26	126
9/10/11.8.92	19	95	111	13	98	126	57	69
25/26.8.92	19	95	89	19	70	99	70	29
8/10.9.92	18	90	51	14	37	47	34	13
26/27.9.92	20	100	15	6	9	27	25	2
Stanground								
16.7.92	4	20	32	0	32	65	14	51
27.7.92	4	20	23	11	12	53	27	26
13.8.92	4	20	13	10	3	35	16	19
28.9.92	4	20	0	0	0	53	27	26
21.10.92	4	20	0	0	0	34	22	12
12.11.92	4	20	0	0	0	6	6	0

•Two ponds at Woodwalton dried out, then re-filled.

CONCLUSION

This paper should be regarded as preliminary recognition of the walking stage and its application to ecological study. At this point in time it seems to hold considerable promise for the study of the final phase of metamorphosis in newts.

ACKNOWLEDGEMENT

We are grateful to Dr A Gent for helpful comments on an early draft of this paper.

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NEW RECORD OF A NESTING LOGGERHEAD TURTLE *CARETTA CARETTA* IN WESTERN MEDITERRANEAN

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The Loggerhead Turtle *(Caretta caretta)* is the commonest marine turtle living in the Mediterranean. Many observations and captures have been made in the Spanish Mediterranean coast as reported in the literature (see the review by Pascual, 1985). *Caretta caretta* has been reported to nest in several localities in the eastern Mediterranean: Greece, Turkey, Cyprus, Libya, Israel and Egypt (see Dodd, 1988; Maigret 1986; Groombridge, 1990 and references therein). However, the nesting citations in western Mediterranean are scarce and/or not recent (Lampedusa Island, Tunisia, Argano and Baldari, 1983; Corsica, Delaugerre, 1987; Sardinia, Tunisia and Sicily, see also Dodd, 1988 and Groombridge, 1990). No nesting sites have ben found either in Algeria or in Morocco although this coast has been prospected intensively (Laurent, 1990).

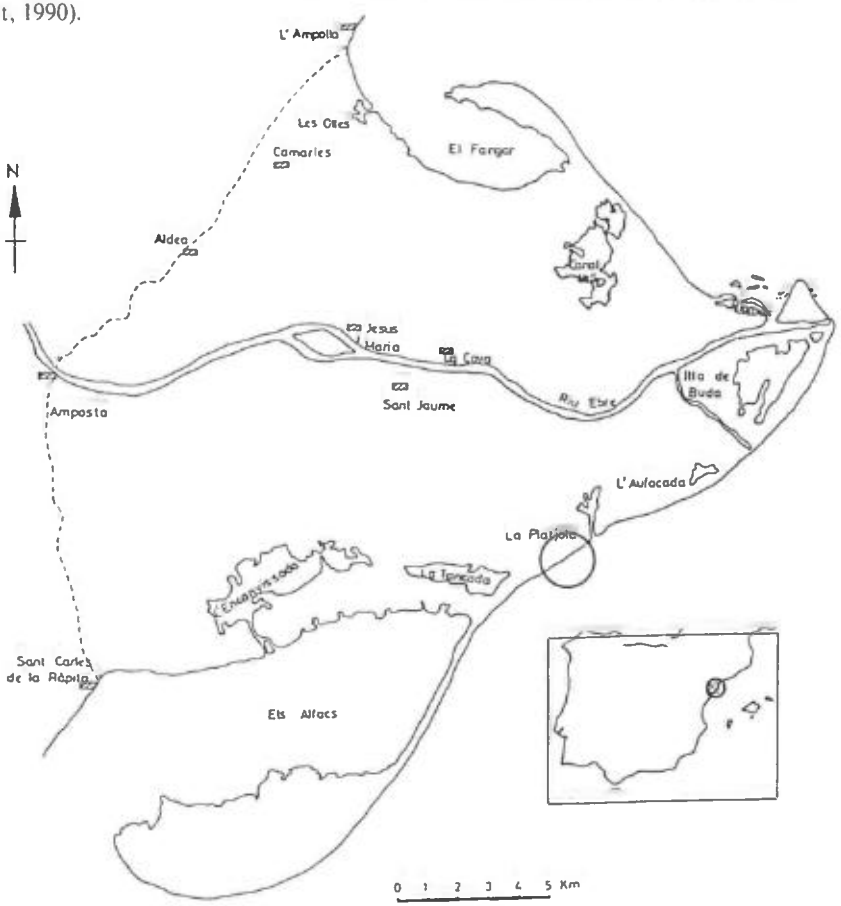

Figure 1 – Locality of the record.

On the Spanish coast, very few records have been registered during the last 100 years. Mayol (cited by Groombridge, 1990), points out that the low sand temperatures, the marine currents and the human disturbance could preclude the turtle nesting or the embryo development. Despite of that, a probable case of nesting was detected in Mar Menor (Murcia province, SE Spain) in 1870 and is reported by Salvador (1974). Since then, only an adult female was reported to be found in healthy condition on a beach near Málaga (Caminas, 1988).

In September 1990, a hatchling Loggerhead Turtle was found dead on ground on Eucaliptus beach, located in the south of the Ebro Delta near La Platjola lagoon (NE Spain, U.T.M. square 31TCF00 Fig. 1.). This site is close to a protected area: the Parc Natural del Delta de l'Ebre. No other hatchlings were detected at the same time. The specimen was picked up by an amateur naturalist and stored for two years in the DEPANA (Defensa del Patrimoni Natural) head office without publishing that information.

The specimen shows the yolk sac connected to the belly (Fig. 2). Some of its biometrial and meristic features are:

Carapace straight length: 34.10 mm
Carapace straight width: 27.50 mm
Plastron length: 24.90 mm
Plastron width: 25.00 mm
Number of vertebral scutes: 6
Number of costal scutes: 6
Number of marginal scutes: right 13/left 12
Number of inframarginal scutes: 3 (+ 1 small)
Number of prefrontal scales: 4

The animal was deposited in the collection of the Department of Animal Biology (Vertebrates) at the University of Barelona with the number DZBH-2687.

The presence of yolk sac seems to indicate that this animal is an unborn individual belonging to a clutch deposited on this beach. It is interesting to remark that the number of vertebral and costal scutes (6 in both cases, instead of 5) are higher than usual (Dodd, 1988).

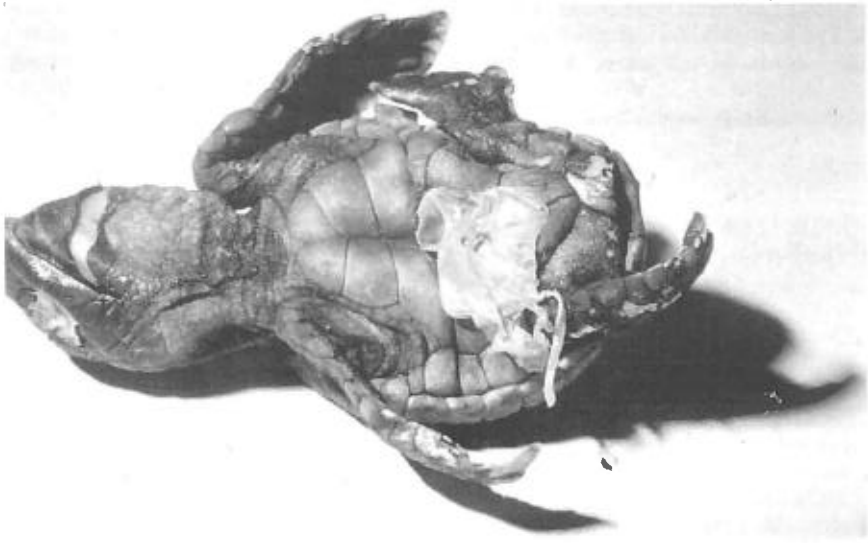

Figure 2 – Hatchling of Loggerhead Turtle (*Caretta caretta)* found in Ebro Delta (Spain). Dorsal and ventral view.

Additionally, a carapace of a young Loggerhead Turtle (less than 20 cm length) is conserved in the museum of the Ebro Delta Natural Park (Bertolero, pers. com.). It was collected in 1991 on the outer coast of the Ebro Delta (no more details were provided).

The Ebro Delta is geologically very recent. The southern lobe completed its development during the XVIth century and the sand bar of Trabucador was formed only 100 years ago (Maldonado, 1977). The lack of historical references and complementary information in relation to these isolated records do not allow us to catalogue the Ebro Delta as a habitual nesting site. Nevertheless, further research should be carried out for any sign of nesting in order to envisage protection measures for this site.

ACKNOWLEDGEMENTS

We would like to thank Jordi Bou, who picked up the animal, Vicente Fouces for the information and DEPANA for the cession of the specimen.

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THE REPRODUCTION OF THE ARGENTINE BLACK AND WHITE TEGU, *TUPINAMBIS TEGUIXIN*, IN CAPTIVITY

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In May, 1989, I purchased four young *Tupinambis teguixin* from Buenos Aires. They were so small that I presume they were born that same year.

For these Tegus I prepared a terrarium with a surface area of 3m x 3m, dug into the ground in such a way that during winter, when the terrarium is simply covered by glass, it will remain frost-free. In fact, I did not initially plan to hibernate these animals until I discovered, in August 1989, that they started digging burrows, and in September they were no longer active, in spite of the fact that the weather was still hot. As I was unsure about their ability to hibernate, I checked the condition of the animals every month through the winter by opening the entrance of the burrow and feeding the animals inside with my hand to see if they were still alive. When touched they moved slowly and later always closed their burrow from the inside.

In Alabama we have hot moist summers which last until the end of September. By November the first night frosts may occur, and mid-winter temperatures may drop to as low as minus 10°C.

In the years following 1989 I made notes on the animals' hibernation, summarized in Table 1.

Table 1. Dates of Hibernation of Tegus under semi-natural conditions in Alabama

Animals start digging	Animals disappear into hibernation	Day/Night Temperature at that date	Animals emerge from hibernation	Day/Night temperature at that date
14 August, 1990	18 September 1990 (all 4)	90°F/60° (32°C/16°C)	10 March, 1991(1) 19 March, 1991(3)	65°F/(18°C) 72°F/(22°C)
12 August, 1991	4 September, 1991 (all 4)	90°F/70° (32°C/21°C)	24 March, 1992(1) remaining 3 some days later	–/30°F/(-1°C)
19 August, 1992	15 September, 1992 (all 4)	80°F/60° (27°C/16°C)		

In addition to the information given in Table 1, the following notes are of interest:

1. On 19 March, 1991, the temperature of the hibernation burrow from which the animals had just emerged was 15°C (59°F).
2. In the Autumn of 1991 the Tegus began their hibernation about 10 days earlier than the previous year, and in the same season, on 8 October 1991, the night temperature dropped to a record low of 34°F (59°F)
3. On 3 March, 1992, the day/night temperatures were 80°F/55°F (27°C/13°C), but the high day temperature did not trigger emergence.

Plate 1. – Adult male *Tupinambis teguixin* from Argentina *photo: Stephen Peltz*

Plate 2. – Author with adult female *Tupinambis teguixin*, an escapee recaptured after egglaying on the author's farm in Alabama *photo: Bert Langerwerf*

Plate 3. – Young *Tupinambis teguixin* emerging from hibernation in March, 1990, covered in sand and mud – a characteristic appearance every year on the first day out of hibernation.

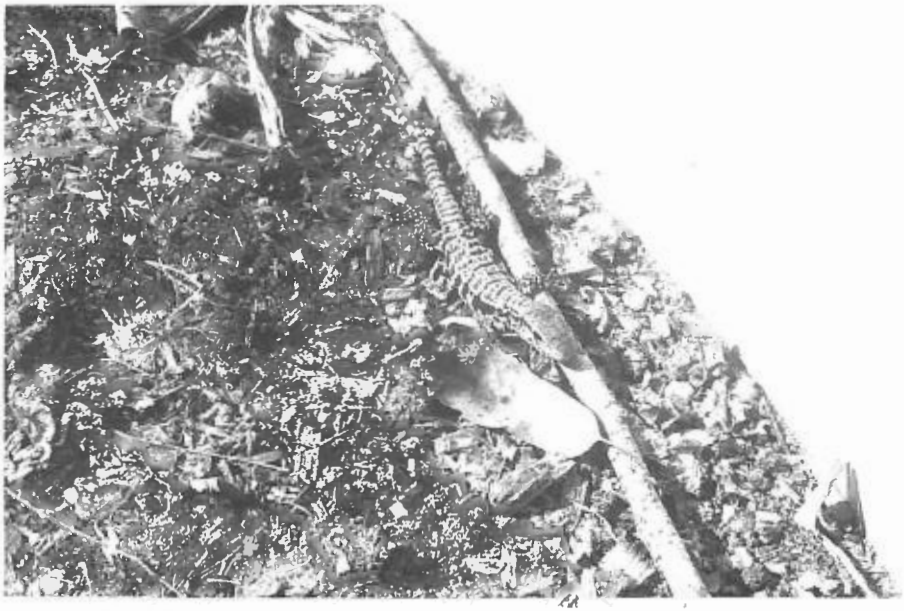

Plate 4. – Juvenile *Tupinambis teguixin* hatched under natural conditions outdoors in Alabama U.S.A.

Plate 5. – One of the author's outdoor enclosures for Tegus.

4. The winter of 1991-1992 was the longest hibernation period: 4 September, 1991 – 24 March, 1992. Three of the animals took some days more, making a hibernation of close to 7 months!

5. As a rule the animals' year is divided into 6 months of activity, during the last month of which no food is taken, followed by 6 months of hibernation, which means that the animals survive 7 months or more without food.

This is all totally in contradiction to the generally accepted belief that *Tupinambis teguixin* is a tropical animal which does not hibernate. My Tegus hibernate for longer than any other lizard which I keep, such as *Lacerta viridis, L. lepida, L. strigata, Agama stellio.*

During the summer of 1992 my animals reached sexual maturity, at an age of 3 years (1½ years of active life). Alas, I never saw copulation, as I have too many vivaria to watch, but in the last days of June, 1992, something remarkable happened. One of the females escaped from the cage, using considerable force to push up the lid, weighted by a heavy stone. Before this, none of the Tegus ever attempted to escape or even to climb the concrete wall to reach the lid. Further, the remaining 3 animals did not take the opportunity of the open lid left by the escapee to escape themselves. At that time I was not aware that the female was gravid and wanted by all means to find privacy to make a nest, perhaps to avoid predation on its eggs by the other Tegus, as Tegus are particularly fond of eggs of all kinds. Mr J.J. de la Fonteyne mentions in *Lacerta* (December 1964, pp. 19-20), how a male Tegu ate the eggs of the female immediately after deposition.

On 8 July (about 10 days later), we found the escaped Tegu in my rat-barn. She was slender and was eating one rat after another, even when I came to catch her.

Between 9 and 14 October we caught 7 recently hatched, shiny green baby Tegus at the side of the same rat barn – I spent one day digging around the area but could not discover the nesting site. The hatchlings, some of them with some clayish soil around the head still, measured 8-12 cm.

Dr Achaval (in Montevideo, Uruguay), notes that Tegus lay their eggs in termite nests, where they have regular temperature and moisture. But probably the Tegus do this also to make their eggs safe from other Tegus. Now, these conditions are of course hard to imitate in a terrarium. But my friend Dr Luis Magnasco from Buenos Aires has written to me that around Buenos Aires these termite nests are lacking, and that he saw shiny green Tegu hatchlings emerge from beneath his swimming pool.

Between the beginning of July and the end of September, the temperatures on my farm in Alabama were about 90-95°F (32-35°C) during the day and 70-75°F (21-24°C) at night, so that I can more or less assume an average of 82°F and an incubation period of 3 months. Here I want to note a similarity with *Lacerta lepida*, which also has a long incubation period. This long incubation period is in my opinion very significant and advantageous for the survival of the young ones as in the case of both species the young emerge when the adults are already hibernating.

The young, which have less body mass, need much less solar radiation to heat up their bodies, and so can feed and grow until late Autumn.

COMPARISON WITH OTHER RECORDS OF CAPTIVE REPRODUCTION

In 1989 Mr Gunther Köhler described the reproduction of *Tupinambis teguixin* in captivity in Germany. There are striking differences between his records and mine:

1. Köhler noted an incubation period of 152-171 days, compared with my 90 days (compare also with Hall, B.J., İ978, International Zoo Yearbook, London, 18: 91-95).
2. The hatchlings are not shiny green in colour, compared to my animals of Argentine origin.

If the Argentine *T. teguixin* needed over 5 months for the eggs to hatch, then the eggs would spoil in the cold winter months, so Köhler and Hall probably worked with specimens of tropical origin. If this is the case, then consideration should be given to the division of *Tupinambis teguixin* into at least two subspecies, because of these clear differences. One could also wonder what is the advantage of being green when born in Argentina and brown when born in the tropics.

A NOTE ON DISTRIBUTION AND CLIMATE

Dr. J.M. Cei (1986) mentions that *Tupinambis teguixin* is found in the following regions of Argentina: Misiones, Corrientes, Entre Rios, Santa Fé province of Buenos Aires and in Córdoba in Rio Cuarto as far as the mountains. Outside Argentina, to the north, this lizard is found over most of mainland South America, therefore occupying areas of both tropical and temperate climate.

I give below climate data for Córdoba, Agentina, a place inhabited by this lizard:

Table 2. Temperatues at Cordóba, Argentina

	Absolute Maximum	Average Maximum	Average Minimum	Absolute Minimum
January	114°F(46°C)	88°F(31°C)	61°F(16°C)	42°F(6°C)
February	111(44)	86(30)	60(16)	38(3)
March	99(37)	82(28)	58(14)	33(1)
April	94(34)	75(24)	51(11)	31(-1)
May	92(33)	69(21)	44(7)	20(-7)
June	89(32)	64(18)	38(3)	17(-8)
July	95(35)	65(18)	38(3)	13(!)(-11)
August	98(37)	69(21)	40(4)	19(-7)
September	100(38)	73(23)	45(7)	21(-6)
October	105(41)	82(28)	56(13)	36(2)
December	109(43)	86(30)	60(16)	39(4)

The rainfall in Cordóba is 28 inches per year, mainly in the warm season.

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CAPTIVE REPRODUCTION OF *ELAPHE MANDARINA* (CANTOR 1843)

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INTRODUCTION

The adults in this report were originally hatched from a clutch of eggs laid by a wild caught gravid female, imported by an Italian dealer. Subsequently Mike Nolan, in the UK, purchased 2.1 hatchlings from this clutch. The hatchlings were raised over the next three years to adults, although unfortunately one of the two males died, possibly aggravated by low humidity (Mike Nolan, personal communication). During 1991 Mike successfully bred from the remaining pair, resulting in one surviving male hatchling from an original clutch of three eggs.

The two adults plus the remaining male hatchling were obtained from Mike Nolan on 14th December 1992 by a private consortium of British reptile breeders, including the author. The two adults were lodged with the author while the male hatchling was raised by another consortium member.

This paper describes the authors first year's maintenance and successful reproduction with this pair of *Elaphe mandarina*. The results appear to confirm the previous conclusions of Trevor Smith (1989).

ACCOMMODATION FOR ADULTS

The adult pair had been initially raised from hatchlings in well ventilated polythene boxes, on a damp substrate of pine bark chippings.

Following the consortium's obtaining the adults in December 1991, the pair were set up individually in polyethylene meat trays, measuring 630mm long x 380mm wide x 150mm deep, within a close fitting drawer compartment system, used to house various other Colubrid snakes.

A soil heating cable (Jemp Ltd.) was set in a routed groove, covered with aluminium tape, to distribute heat more evenly, approximately 150mm from the rear of the base of each compartment. The heating cable was controlled by a thermostat with a remote air temperature sensitive probe placed adjacent to the heating cable. This allowed for the control of a precise hotspot within the trays whilst not particularly controlling overall air temperature. In addition the trays could be pulled forward away from the heating cable so that only the rear edge of the tray was heated, or pushed in to provide a hotspot approximately 150mm from the back of the tray.

The room containing the drawer system was heated by a thermostatically controlled electric fan heater to provide a reasonably controlled ambient air temperature. An extractor fan sited at the top edge of the west facing wall of the room was controlled by a thermostat placed in the centre of the room's ceiling.

The trays were furnished with clean white wood shavings and two 2kg polythylene margarine tubs, both with 60mm square holes cut into the lids. One contained fresh water and was placed at the front of the tray, furthest from the heat source. The second was placed in the middle of the tray and was packed with damp sphagnum moss.

TEMPERATURE AND HUMIDITY CONTROL FOR ADULTS

Following receipt on 14th December 1991 the heating cable was already set to a temperature of 15°C, for the hibernation of the other housed snakes. For the *E. mandarina* their trays were pulled forward, so that only the back edge of the tray was heated. The ambient room temperature was already set at 10°C, and the extractor fan set at 15°C.

Micro-humidity was provided in the tub by packing it with damp sphagnum moss. The specimens both spent most of their time in their "wet-boxes" during this hibernation period. They were observed to be quite active at times however and were seen to drink from their water tubs during this hibernation period. The moss was sprayed with water at a temperature of approximately 10°C from time to time to maintain an even dampness without actually becoming wet.

Water was replenished frequently even during hibernation. Ashley and Burchfield (1966) found that snakes were attracted to fresh water and were stimulated to drink. They recommended changing the water daily.

E. mandarina appears to suffer if not provided with a high humidity (Smith, 1989) and constant access to fresh water. The provision of a "wet-box" as outlined above seems to provide this requirement, within an enclosed retreat, which allows the snakes to also dry off within the main area of he vivarium, if required. I believe that this is an important consideration for this species to prevent the occurrence of blister disease (necrotic dermatitis), which is well documented (Marcus, 1981 for example).

On the 1st March 1992 the heat tape was reset at 28°C, the room ambient was set at 18°C, and the extractor fan at 25°C. The trays containing the *E. mandarina* were maintained in the pulled forward position. The snakes continued to spend long periods in their "wet-boxes" and were only rarely found basking at the warmest end of the tray. No attempt was made to vary night time temperatures though inevitably there was a night time drop in ambient of 2-3°C. Temperatures recorded at the front of their trays varied between 16-20°C, depending upon ambient room temperature. Temperatures recorded at the warmer end of their trays varied between 23-26°C.

CAPTIVE REPRODUCTION

On the 4th of March 1992, three days following the end of hibernation, three freshly killed weaned mice were placed on the lids of both snakes' "wet-boxes", adjacent to the access holes. Both snakes fed overnight without problem. Four days later the same feeding regime was repeated. On this occasion only the female fed during the night.

The male's refusal to feed was taken as an indication of his readiness to breed. Therefore he was transferred to the female's tray complete with his own "wet-box" on the 10th March. Food was offered at the same frequency and quantity, and most would be consumed overnight, as previously. As all the food was not consumed it was assumed that the male was not feeding, as is often the case with other breeding Colubrid males.

No actual mating was observed, and it was presumed to have taken place at night. For a period from 24th March to the 2nd of April it was observed that the wood shavings were significantly disturbed on three separate occasions. This was interpreted as possible courtship and mating activity. The male was removed to his own tray on 7th April, and resumed feeding on the 16th April.

EGG LAYING AND INCUBATION

The female continued to feed until 19th April, by which time it was apparent that she was gravid. Her post coital slough occurred on the 19th May, and 13 days later on 1st June she laid four eggs in her "wet-box". This compares with a period of 11 days recorded from the post coital slough to egg laying by Gillingham (Smith, 1989).

The eggs were removed from the "wet-box" and transferred to a plastic box containing equal parts by weight of water and vermiculite. Each egg was weighed and measured, and individually marked with a graphite pencil (see Table 1). This box was incubated at temperatures ranging from 30-25°C within a walk-in incubator. The lid of the plastic box was ventilated with several small holes, and the lid was removed daily to inspect the eggs and allow a change of air.

Plate 1. – *Elaphe mandarina* hatchling. *photo: Jon Coote*

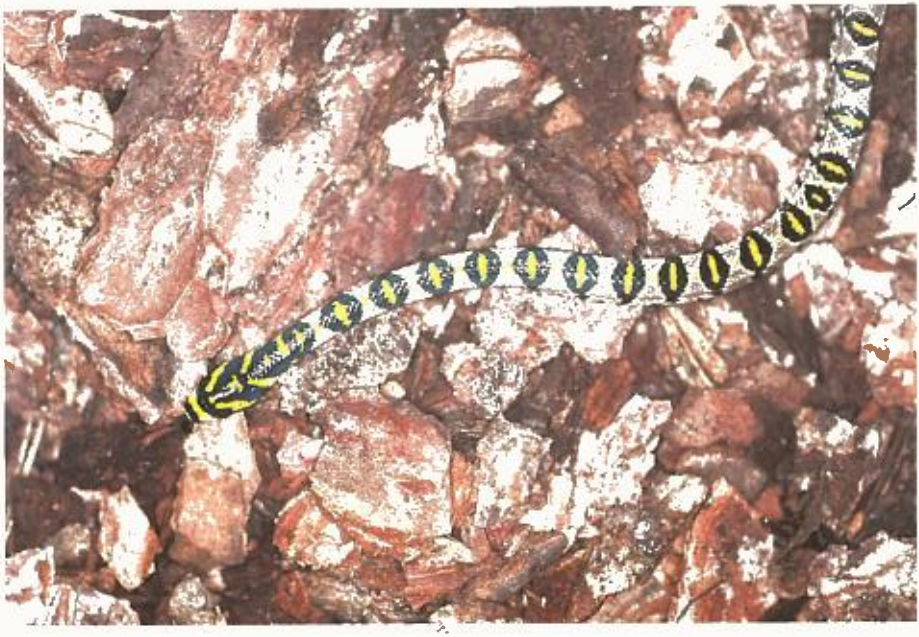

Plate 2. Juvenile *Elaphe mandarina*.

The female continued to remain in the "wet-box" after her eggs were removed, and continued to refuse food, including "pinky" mice. She did "kill" one freshly killed furry mouse, introduced directly into the "wet-box", but did not eat it. She finally began feeding again on the 16th July. This may indicate some degree of maternal protection during incubation for this species, coupled with her "killing" the introduced furry mouse.

HATCHING AND HATCHLINGS

The first egg started to hatch on 24th July was observed to have collapsed slightly on 20th July; this probably indicated imminent hatching rather than lack of humidity. The final hatchling emerged from its egg on 27th July. The incubation period was therefore a period of 53-56 days. This compares to 49-54 days recorded by Gillingham (Smith, 1989).

All hatchlings were measured using the "Squeeze-box" technique (Quinn, 1974), weighed, and probed (Laszlo 1975) to determine sex. All four hatchlings were males. (See Table 1).

The squeeze box technique involves trapping the hatchling against a sheet of foam rubber with a clear perspex sheet. Whilst immobilised a line is drawn along the vertebral column of the hatchling onto the clear sheet. This drawn line is then later closely followed with a piece of dacron thread (minimal tendency to stretch) and measured against a rule.

Table 1

No.	Egg weight	Length	Width	Pipped	Hatched	Sex	Total Length	Weight
1	25.5g	67mm	23mm	24/7	24/7	M	334mm	17g
2	21.5g	65mm	22.5mm	25/7	25/7	M	330mm	18g
3	24g	66mm	23.5mm	26/7	27/7	M	343mm	19g
4	24g	69mm	22mm	26/7	27/7	M	339mm	17g

All the hatchlings were individually housed in small well ventilated plastic boxes, complete with miniature versions of the adults' water tubs and "wet-boxes". Initially the hatchlings were kept at similar temperatures to the adults. It was later found however that they were stimulated to feed better at a slightly higher temperature, similar to that commonly used for other *Elaphe* and *Lampropeltis* species (hotspot of 25-30°C).

The hatchlings' first slough was after an average of 9 days. New born "pinky mice" were offered immediately after this first slough. Two hatchlings fed without problem, but the other two only fed after the increase in temperature was introduced.

CONCLUSIONS AND COMMENTS

As predicted by Trevor Smith (1989) the captive hatched and raised adults have presented few problems, provided that they are never allowed to become dehydrated. This simple problem is probably why wild caught animals fail to thrive, as probably their kidneys are irreparably damaged due to dehydration during their period from capture to final captive destination. I believe that hatchlings are particularly prone to dehydrate when sloughing, and remedial attention at this time is advisable.

Feeding presents few problems, and the adults have taken adult dead mice on occasions, though like most snakes they prefer smaller prey if available. Hatchlings appear to require a slightly higher temperature compared to adults to illicit a strong feeding response. It would be wise in future to remove the "wet-box" the female laid in and replace with another. This would probably result in the female feeding more rapidly after egg laying.

Captive raised *E. mandarina* are still quite highly strung animals, but they are not aggressive. They require good security and access to water at all times. Normal temperatures as used for other Colubrids appear to be ideal, unlike the cooler conditions recommended for wild caught animals.

Gillingham incubated two clutches of *E. mandarina* eggs (Smith, 1989), one of six eggs at a temperature of 24-27°C, which resulted in 3 males and 3 females, and one of two eggs incubated at 25.5-27.7°C, which produced 2 males. My incubation of four eggs at 25-30°C also resulted in all males. It is possible that the sex ratio of this particular snake species responds to incubation temperatures, in the same way that turtles, crocodilians and many lizard species do. Lower incubation temperatures than used in this report are therefore currently recommended to obtain equal sex ratios.

A detailed species description and natural history for *E.mandarina* can be found in Smith (1989), complete with recommendations for captive care, particularly of wild caught specimens.

In conclusion the captive care of *E.mandarina* appears to be, in most respects, very similar to that of *Elaphe situla*, which I also maintain in my collection.

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LETTERS TO THE EDITORS

Herpetology of Yemen

Dear Sirs,

In March '93 I shall be writing to the Republic of Yemen for 2 months on an Ornithological Society of the Middle East expedition. The expedition is primarily aimed at bird studies but I shall be concentrating on the herpetofauna.

I am currently seeking information on all species of reptile and amphibian occurring in this region (including Socotra) and was wondering if you could provide me with contact addresses of any relevant authorities or location of any papers covering herpetology in Yemen.

Yours faithfully,

Dave Showler
30 Essex Street, Norwich, NR2 2BL

Grass Snake preys on Sand Lizard

Dear Sirs,

After speaking to Jan Clemens on the telephone I was advised to speak to you. I hope you find this article of interest.

I am doing a survey for English Nature concerning reptiles. I brought home a very thin Grass-Snake for feeding up from Upton Heath, Dorset.

The Grass-Snake was basking at an Adder hibernaculum where there is a small Sand Lizard colony also. The Grass-Snake measured 15 inches and was a male.

On returning home on Wednesday 9th September I fed the snake on two small frogs which it ate that night.

On Friday when I returned home, to my amazement the snake had regurgitated the two frogs and a fully grown female Sand Lizard.

I hope this has been of interest.

Yours faithfully,

Jeremy Stanley
20 Warland Way, Corfe Mullen, Wimborne, Dorset

THE HUSBANDRY AND CAPTIVE PROPAGATION OF THE SOUTHERN ROCK PYTHON, *PYTHON SEBAE NATALENSIS*

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INTRODUCTION

The African Rock Python, *Python sebae* (Fig. 1) is distributed throughout much of sub-Saharan Africa, extending along the Nile valley into Egypt. In southern Africa it is restricted to northern Namibia and Botswana, extending through the northern and eastern Tansvaal, to Natal and the Transkei (Map 1). Pythons were previously found in the eastern Cape Province as far south as Bathurst where it became extinct in 1927 (Broadley, 1983). Branch (1988a) reported on an apparent successful reintroduction of the species into the eastern Cape.

Broadley (1984) recently recognised the southern race (Python sebae natalensis) of the African Rock Python as distinct from the typical race from west and central Africa. The recently described Lesser Rock Python *(P. saxuloides)* from Kenya (Miller & Smith 1979), is treated as a junior synonym of the southern race (Broadley 1983). The African Rock Python is a thick-bodied snake with distinctive markings and size.

As with most "giant" snakes, the size is easily over-exaggerated and most recorded lengths have been of the nominate race. *Python sebae sebae* has been reported to attain a length of 9.8m in the Ivory Coast (Doucet 1963), but full details for this specimen are lacking and cannot now be verified. Arthur Loveridge, whilst collecting in East Africa in 1927, measured a fresh skin of 9.1 metres and even allowing for extensive stretching, it must have been over seven metres long. In southern Africa, *P. s. natalensis* does not appear to exceed 6 metres, and a record of a snake of 5.8 metres from the northern Tansvaal Bushveld is the largest recorded (Branch 1984).

African Pythons normally feed on warm blooded prey such as mammals and birds, but will occasionally eat even Monitor lizards. The size of the prey depends on the size of the snake. Adults often take small Antelope and the largest recorded prey item from any constrictor is that of a 59kg Impala swallowed by a 4.88m python (Rose 1955). Other records include a 6 metre python consuming 6 goats (Taylor 1981), a 5 metre snake ate a pointer watch-dog and puppies (Jensen 1980) and a 4.28m python devouring a six month old female impala (illustrated in Branch 1984). Unusual prey included Baboons (Broadley 1961). Tree squirrels (Kaplan 1992), a Vulture (Verster 1992) and even a Porcupine (Patterson & Bannister 1988). FitzSimons (1930) records pythons even killing Leopards while Halliday & Adler (1986) illustrated a python constricting a crocodile. The African Python is the only snake in Africa large enough to consider humans edible and a number of anecdotal reports exist of human predation by pythons. Loveridge (1931) reported the death of an African woman, found in the coils of a 4.5m snake at Lake Victoria, East Africa. Branch & Haacke (1980) reported on a 13-year old herd-boy that was killed in the northern Transvaal.

Although the species is frequently maintained in captive collections, it is not often bred and is even regarded as notoriously difficult to breed (Ross, 1978; Ross & Marzec 1990). Depending on the size of the female, African pythons lay up to 100 eggs in early summer in Antbear on Warthog burrows (Broadley 1961). Porter (1987) reported an unusual nest site in an open *Panicum* grassland, far from any cover. Mating occurs from May to August and 17-48 eggs are laid in October to November (Branch & Erasmus 1984). These hatch after an incubation period of 62-88 days (Patterson 1974; Scütte 1970).

HABITAT AND STATUS

Pythons have been recorded in a wide variety of habitats, but are most common in moist, rocky, well-wooded valleys (Branch 1988b). They are known to spend long periods in water. Burton (1979) recorded African pythons drowned in fish traps in 2 metres of water in Lake Sibayi, and Haagner (1991a) reported on the aquatic behaviour of a male python in the eastern Transvaal. They are frequently found in and around water, in which they bask and ambush prey. Mainly active during dusk or at night, they may be found basking or occasionally even hunting during the day (pers. obs.). Haacke (1984) and Haacke & Jacobsen (1990) reported the species from the Kalahari sandveld in southern Botswana and northern Cape Province.

Relatively little is known of the wild populations of the African Rock Python. It is well established, and may even be relatively common, in conservation areas, but due to its great size, is easily exterminated. Alexander (1991) reported on the local extinction of the python from municipal Durban. Man is now the python's main predator and threats include collection for skin, 'muti' (African traditional medicine), food, the pet trade and destruction due to its perceived danger to man and livestock. It is known to raid chicken farms, where they are often killed. Natural enemies include crocodiles, honey badgers, mongoose, etc. Pienaar *et al.* (1983) reported a young python in the stomach of a Cape File Snake while Haagner (1991b) reported keratophagous behaviour in a juvenile specimen. Habitat destruction, such as sugar cane farming in Natal, may result in local extinction. Pythons are listed as vulnerable in the South African Red Data Book – Reptiles and Amphibians (Branch 1988b).

THREATS

Due to its size, attractive skin and feeding habits, the python is subject to numerous threats. Dollinger (1982) listed over 300 *Python sebae* skins that were imported into Switzerland while over 10,000 Asian python skins were exported during the same period. Engelmann & Obst (1982) illustrated a village tannery in West Africa processing both African Rock and Ball python (*P. regius*) skins. Many African tribes use python fat and skin in traditional medicines, while it makes a substantial meal as well (Patterson & Bannister 1987).

Pythons control the numbers of cane rats in sugar cane plantations, and for this reason Natal farmers initiated the first efforts to protect the species, leading to the proclamation of the Reptile Protection Ordinance, no. 32 of 1968. It included the Nile crocodile, two monitor lizards, tortoises, terrapins and python (Greig 1984).

ADULT CAPTIVE MAINTENANCE

It is a relatively hardy species in captivity, although wild-caught specimens remain irascible and will often refuse food for periods of a year or more (Broadley 1983). The breeding results achieved at the Manyeleti Reptile Centre and the Port Elizabeth Snake Park are summarised below.

A total of 5 (3:2) adults were maintained for breeding purposes. The largest female was captured in the Manyeleti Game Reserve during December 1986 whilst swallowing a sub-adult Impala ram. She measured 4.7m and weighed 37kg; the Impala weighed 35kg. (see fig 2.). She settled remarkably quickly in captivity but refused food for a period of 14 months. She was offered rats, guinea pigs, cats, rabbits and even a dog. Eventually a newly-born dead Impala calf was offered and immediately taken and swallowed. Subsequently she was fed with sub-adult female Impala every 6-8 weeks. The remainder of the breeding group comprised of 2 captive raised males which were collected as hatchlings while crossing a road. At the time of breeding they were approximately 4 years old. Another two adult females were collected whilst raiding chicken farms in the Giyani district.

The snakes were kept in a large "environmental room" of dimensions 5 x 3.5 x 2.5 metres. A transparent fibre-glass roof allowed the entry of natural sunlight and photoperiod (14 hours

light, 10 hours dark in summer and *vice versa* in winter). The room contained a large drainable pond in which the snakes would often bath for days on end. A louvred window was located on the west facing wall, allowing the pythons to bask in the afternoon sun. Five wooden shelves were attached to the walls at heights ranging from 0.5 to 1.8 m above floor level. This enlarged the surface area of the animals and allowed them to select a "preferred temperature" under the fibreglass roof. A drain in the concrete floor allowed for the room to be hosed clean once a week.

Approximately one quarter of the floor area had thermostatically controlled underfloor heating. On this a large straw-filled hide box (1.5 x 1.2 x 0.5 m) maintained the ambient temperature in the box at 22°C. During a period of extreme cold in 1990, the floor area was covered with a thick layer of straw. Ambient temperatures in the room varied from a minimum of 8°C in winter to a maximum of 37°C in late-summer. Spotlights were installed above the two top shelves to create local "hot-spots" for basking during the winter months when heat penetration through the roof was very low.

Food consisted of dead week-old chicks, rats, guinea pigs and rabbits and was offered every two weeks. Problem or sporadic feeders were stimulated to feed by leaving live guinea pigs in the room overnight. Accurate records were kept of each individual's intake and notes made on shedding, reproductive behaviour, and any noteworthy observation.

During June 1991 several of the first captive bred offspring were transferred from the Manyeleti Reptile Centre to the Port Elizabeth Snake Park. These animals were captive raised from a clutch of 55 laid by the largest female. They were only 25 months old when the two males mated with their sibling sister. She produced her first clutch of viable eggs at 29 months (2.4 years) of age. This female measured 2.73 m and the males 2.22 and 2.46 m respectively. Pitman (1974) reported copulation in captivity of a 6 year old python, measuring 2.43 m. Ross (1978) reported that the youngest female to produce eggs was six years, and the oldest fifteen years.

ACTIVITY

Although observations on the group were only casual, it was clear that the snakes were usually inactive during the day. Greatest activity was normally observed during the early morning, when the snakes moved to the shelves to bask. Observations on wild pythons have shown that the larger adults are nocturnal with movement having been observed as late as 00h30. Juveniles were mostly observed on the roads during the early evening up to 21h00. During January 1987, several newly-hatched pythons were collected in the early morning, and as many as 5 were collected in a single day whilst robbing Spotted-Back Weaver nests. Other than the large female caught while eating the Impala, no active adult pythons have been observed during the day.

Several snakes, however, had regular basking spots where they were regularly observed by staff. These included old termitaria, rocky outcrops and next to antbear holes. These snakes were territorial and during the period 1986-1991, several ventral clipped males returned to the same rocky outcrops every winter.

COURTSHIP

Due to the snakes' nocturnal habits, very few observations have been made on reproductive behaviour. Over a period of 5 years, male combat was never observed, although it appeared that the snakes had established a stable, linear social hierarchy similar to that described for *Python molurus* (Barker *et. al.*, 1979).

Reproductive behaviour normally started in early spring. At the Manyeleti Reptile Centre this was mainly observed in August, whilst at Port Elizabeth Snake Park it occurred from late September to early November. Courtship and mating behaviour follows the triphasic pattern observed in colubrids (Gillingham et al., 1977) with some minor differences. Most noticeable

is the lack of jerky movements and head bobbing by the male. On contact with the female's body, the male lifts his head to her dorsum and begins a dorsal anterior advance with his head adpressed. This movement is slow and invariably terminates before he makes contact with the female's head region. On several occasions the male moved dorsally to just posterior of the female's head and gently nudged her nape with his snout. This is accompanied by rapid tongue-flicking. No use of spurs has been noticed as reported for other boids, e.g. *Sanzinia madagascariensis* (Carpenter *et. al.* 1978) and *Pythong molurus* (Gillingham & Chambers 1982).

After attaining a mounted position the male began to make one or two C-shaped body curves in sliding movements. He slowly advanced in an anterior direction and eventually brought his tail onto the female's dorsum. He then aligned his tail in a ventro-lateral position with that of the female. The female normally responded by lifting her tail slightly. Failure to achieve intromission is normally due to the female's refusal to lift her tail. Gillingham *et al.* (1977) and Gillingham & Chambers (1982) have shown that intromission can only occur when the female voluntarily opens the cloacal orifice to permit male entry. Copulation lasted between 54 and 173 minutes (n=4). Gillingham & Barker (1982) found that the mean copulation time for a group of Burmese pythons was 6 hours 45 minutes.

OVIPOSITION AND INCUBATION

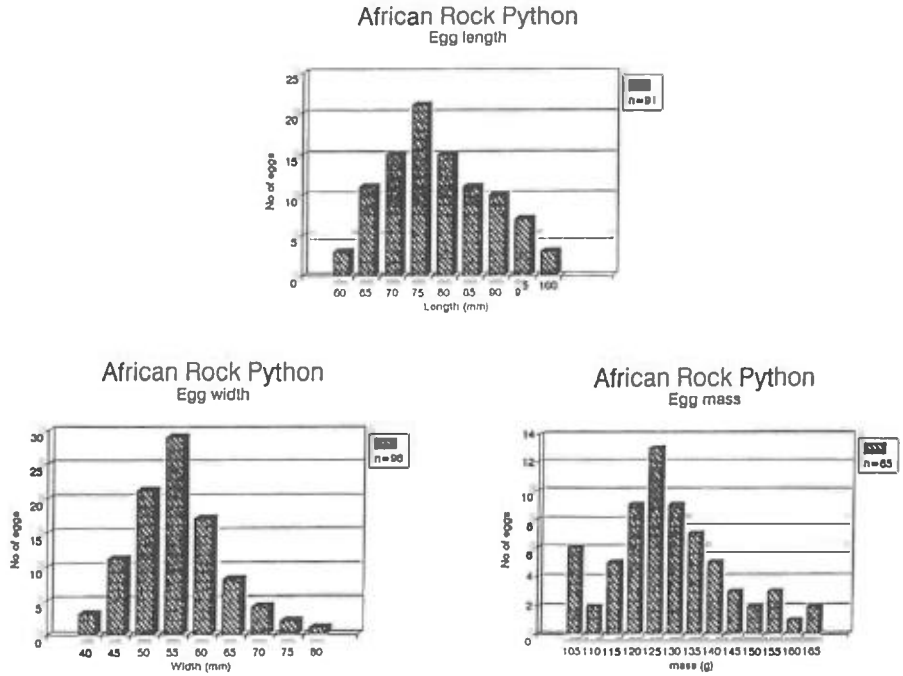
The female bcomes noticeably swollen posteriorly, especially during the latter half of the gestation period when she will refuse food. The eggs are laid after a gestation period of 107-115 days. At the time of oviposition, the female normally becomes increasingly aggressive.

The eggs are normally laid during the night or early morning. One female that was observed took 3 hours 17 minutes to complete a clutch of 55 eggs. Very few documented records exist on the incubation period for the species. Ross (1978) and Ross & Marzec (1990) reported that at 72-106 days, the incubation period in this species is significantly longer than any other python species.

The eggs are smooth, white and moderately adherent. The female remains coiled around the eggs during oviposition, and will remain as such during the incubation period (see Fig. 3.). Even if the eggs are removed, the female will remain coiled in the same position and location for an extended period. In such circumstances, it is advisable that the female is regularly disturbed "brooding" behaviour, to ensure she resumes regular feeding as soon as possible. Females left to brood their eggs have not been observed to move in order to drink or feed during the incubation period. Van Mierop & Besette (1981) reported occasional feeding and even basking behaviour in a brooding Ball python, *P. regius.*

The eggs were removed as soon as detected, separated and full biometrics taken (Fig.'s 1-3, Table 1). It is important to separate the eggs as soon as possible to allow for ease of incubation. The eggs were incubated (3-4 per box) in a substrate of moistened vermiculite in clear sealable containers (35 x 35 x 20cm) as described by *Tryon* (1975) at 30-31°C. The containers are opened two or three times weekly to allow for air circulation. Any infertile or fungus covered eggs are removed. These were inspected to determine fertility and if possible the cause of death of the embryo. Incubation periods under these conditions varied between 79-83 days (n=5). The hatchlings do not fully emerge from the egg until 24-36 hours after the initial slits appear in the egg.

Problems were encountered with the death of embryos just prior to hatching. This syndrome seems relatively common in the captive breeding of pythons (Moran pers. comm.). It appears to be particularly noticeable if large numbers of eggs are incubated in a single container, and may be due to the lack of sufficient oxygen. This may occur if eggs have to be incubated in a clump. It is therefore important to inspect gravid females regularly and to collect the eggs as soon as they have been laid. This allows for easy separation of the eggs. Dunn (1974) reported on the successful hatching of 34 young where the egg mass was incubated in a single container. Unfortunately he did not record the frequency of inspections or the size of the incubation container.



Fig's 1-3. Biometric data on the African Rock Python eggs.

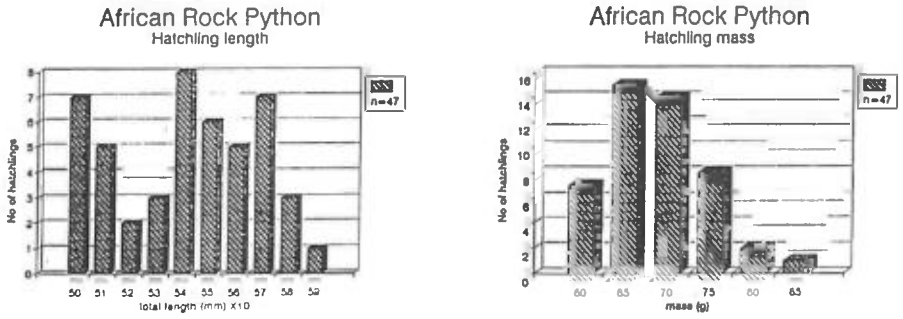


Fig. 4-5. Biometric data on the African Python hatchlings.

CLUTCH SIZE AND FERTILITY

As in most snakes, the number of eggs produced depends on the size and condition of the female. Female and clutch size is positively correlated. Less well understood is the correlation between size of the female and egg size (Ford & Seigel 1989). Large females lay more, not bigger eggs, than smaller females. FitzSimons (1930) noted that large pythons lay greater numbers of eggs than small individuals. Obvious exceptions exist when larger females produce small clutches due to poor health or sperm unviability. FitzSimons (1962) stated that usually 30-50 (exceptionally up to 100) eggs are laid of which as many as 50% may be infertile. Branch & Erasmus (1984) recorded the relationship between the size of the female and clutch and egg size. The mean clutch size for the southern race is 30.5 (range 17-74, n=14). The smallest clutch reported was that of 17 produced by a female of undetermined size after a gestation period of 71 days (Schmidt 1971). The largest clutch recorded is 74 which was discovered in a decomposing haystack. In this case 84% of the eggs hatched and only 10% were infertile (Porter 1987).

Branch & Erasmus (1984) reported a 91% fertility rate in captive bred clutches. At the Manyeleti Reptile Centre, the average fertility rate was 78.4% (range 62-94%, n=5). There is a decline in sperm viability with age, which results in smaller clutches and even an increased deformity rate in the resultant young (Branch & Erasmus 1984). Visser (1985) reported sperm retention in a female that laid a clutch of 33 eggs four years after having been in contact with a male. Only ten of the eggs were fertile.

HATCHLING MAINTENANCE

The hatchlings were immediately weighed and measured (Fig's 4-5) upon emergence. They were individually housed in clear plastic boxes (35 x 35 x 20 cm) with a newspaper substrate, a potplant driptray for water and an inverted driptray for cover. Temperature was maintained at 30-32°C with a static photoperiod of 12/12 hours dark/light.

All hatchlings were highly alert and easily stressed when disturbed. Food (young weaned mice), was offered only after each snake had undergone its first shed, which occurred 7-13 days after emergence. Very few problems were encountered with the initial acceptance of food. Problem feeders were force fed on newborn day-old mice until spontaneous acceptance occurred. Growth was extremely rapid, with a female attaining a total length of 2.1 meters within 18 months.

DISCUSSION

The captive husbandry and reproduction of *Python s. natalensis* is similar in many aspects to that of the more commonly kept *P. molurus*. As in *P. molurus* and other pythons, the female usually stops feeding some weeks after mating and coils around the eggs until they hatch. Pitman (1973) stated that the female African rock python has the "ability to thermoregulate body heat by conspicuous musculature contraction as do *P. regius* and *P. molurus*".

Unfortunately Pitman does not elaborate or give his source. There is no evidence that the female African Rock Pythons became facultative endotherms during incubation. In addition, Van Mierop & Bessette (1981) and Ross & Marzec (1990) found no evidence of such endothermic activity in captive *P. regius*. In the genus *Python*, the production of endogenous heat by means of contractions of the body has only been proven for *P. molurus* (Hatchinson, Dowling & Vineger 1966; Vineger, Hutchinson & Dowling 1970, Van Meriop & Barnard 1978).

The incubation temperature for python eggs appears to be critical. Joshi (1967) stated: "in the tropics, particularly West Africa, laid eggs of *P. sebae* do not need to be incubated by the female. A moist atmosphere and high temperature are sufficient to allow further development of the already advanced embryo, which hatched in about two months". He, however, had low hatchling success (32.3%) when he incubated the eggs at temperatures of 72-94°F (22.2-34.4°C). Vinegar (1973) has shown that a constant temperature of around 30.5°C is required

for development. Eggs kept below this, if they do develop, have a low hatching success (27.5°C) or exhibit no development (25°C). Brooding *P. molurus* maintain a temperature of 30-32°C (Hutchinson *et. al.* 1966) while *P. s. natalensis* an average of 31°C (Branch & Erasmus 1984). Branch & Patterson (1975) reviewed the variation in incubation period and its relationship to the temperature of incubation.

The African Rock Python has been documented to hybridize with the Indian python, *Python molurus bivittatus* (Branch & Erasmus 1984) (see Fig. 4.). The loss of two of the clutches during incubation and the presence of developmental abnormalities in several of the embryos is suggestive of a possible oxygen deficiency in the incubating eggs. Jackson (1981) commented on the high incidence of developmental deformities of reptile eggs deprived of oxygen during incubation.

The average clutch size for the southern python is 30.5 eggs. This is possibly correlated to the relative smaller size of the southern race in comparison to the northern tropical race which attains a much greater length. Unfortunately very little published data exists for reproduction for the nominate race. Pitman (1974) examined several nests but only comments on one clutch of 50 eggs which contained infertile (small, brown, hard and calcarcous) eggs.

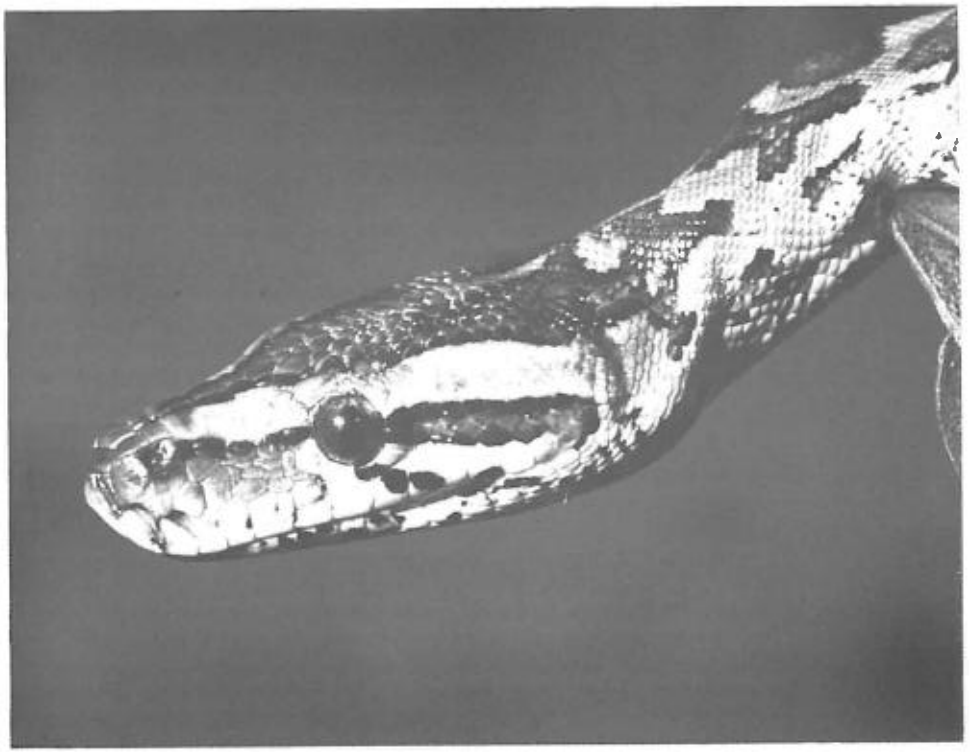
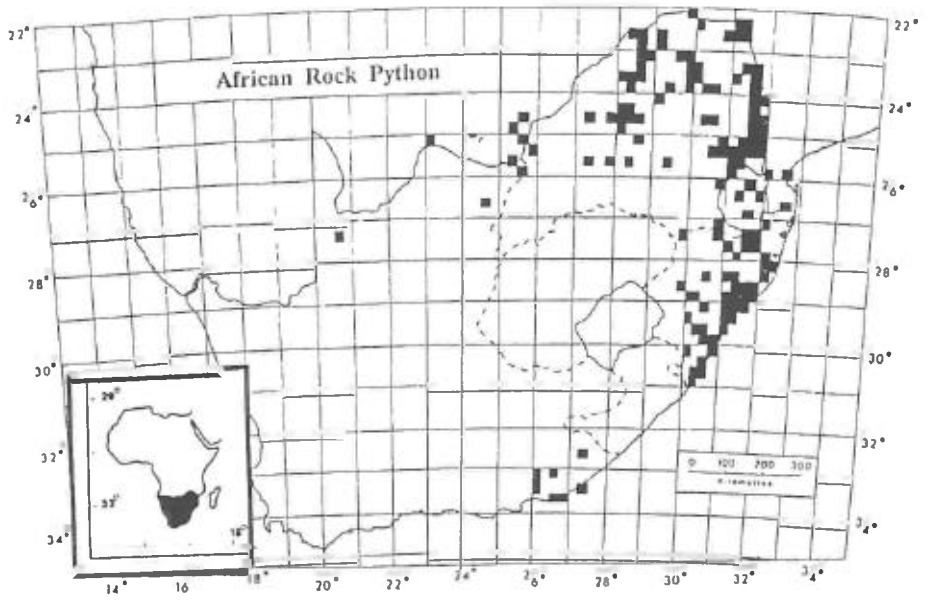


Fig. 1. Juvenile Southern Rock Python

Photograph by Pieter Bos

Fig. 2. Large adult female python caught whilst swallowing the young impala ram. The snake measured 4.7 m and weighed 37 kg while the impala weighed 35 kg

Fig. 3. Captive bred hybrid between the Burmese Python and the Southern Rock Python
Photograph by Bill Branch



Map 1. Distribution of the Southern Rock Python, *Python sebae natalensis* (after Branch 1988b)

Table 1. Summary of reproductive data of *Python sebae natalensis*

Copulation	August – October
Oviposition	November – December
Gestation period	107-115 days
Clutch size	30.5 (23-55) n=5
Egg data	
Mean length	77.23 mm n=91
Range	62.0-92.2 mm
Std. dev.	5.44 mm
Mean width	55.64 mm n=96
Range	52.7-64.2 mm
Std. dev.	5.29 mm
Mean mass	131.75 g n=65
Range	113.9-148.5 g
Std. dev.	9.45 g
Hatchling data	
Incubation period	79-83 days (n=5)
Mean total length	544.97 mm n=47
Range	484-625 mm
Std. dev.	33.11 mm
Mean mass	69.97 g n=47
Range	66.0-77.2 g
Std. dev.	7.75 g

ACKNOWLEDGEMENTS

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REVIEW

Frogs & Toads (1991). Jean C. Roche & Robert Guyetant. Sittelle Cassette Recording (Available from: Wildsounds, PO Box 309, West Byfleet, Surrey KT14 7YA. £7.95 + £1.00 post and packing).

If herpetologists have one thing in common with ornithologists, it is that many of the animals they are interested in are more easily identified by the calls they make than by their plumage or colouration. However, whereas ornithologists have always been spoilt for choice when it comes to field guides and sound recordings, the field herpetologist has had to rely on a handful of keys and field guides which may or may not contain imaginative, but usually useless, written descriptions of frog croaks and calls (will "a musical peep...peep" really help you identify a Midwife Toad in the field?).

This cassette tape brings together, probably for the first time, sound recordings of some twenty of Europe's frogs and toads. Originally produced in France, the tape includes the calls of all the species found in France, Belgium and Switzerland, with introductions provided for each species in English.

The recordings are sensibly organised, with the order of presentation being discoglossids, pelobatids, bufonids, hylids, and ranids. The calls of both individuals and groups are provided for each species. Indeed, it is surprising how different a group of frogs can sound from just one individual. Although this approach is useful, the commentary refers to such calling groups inconsistently as "choirs" and "choruses", or sometimes simply as "many" and "several". I was therefore a little confused whether these terms were an actual indication of the size of the calling group or not. For Spadefoot Toads and Parsley Frogs, both underwater and out of water calls are provided. All the recordings are generally clear, and once learned will be easy to recognise in the field. On side two the calls of the four Green Frogs are also provided slowed down fifteen times, to allow a more detailed comparison of the species. The tape closes with nine frog and toad "concerts", in which the calls of Common Treefrogs, Stripeless Treefrogs, Natterjack Toads, Green Toads, Parsley Frogs and Green Frogs are presented in various combinations.

The accompanying notes provide a brief summary of the various factors which may influence calling behaviour, but unfortunately scientific names of the species are not provided in the notes of commentary. Some of the common names seem to have suffered a little in their translation from French: the Natterjack Toad is referred to by its less well-known name of "Running Toad", and "Laughing Frog" *(Rana ridibunda)* and "Spanish Edible Frog" *(Rana perezi)* had me reaching for my field guides. Having listened to the call of *Rana ridibunda*, however, I wonder if "Laughing Frog" is not a more appropriate description.

Although the European anurans may be rather more drab in appearance than many of their tropical cousins, this tape illustrates that their songs are just as varied and colourful. If you have a Sony Walkman (or even if you haven't), this cassette will be an essential companion for any herp holiday in Europe.

Richard Griffiths

YOUR SOCIETY NEEDS YOU

The BHS is, as we all know, a wonderful thing. As Britain's oldest herpetological society, we can claim patronage by some of the greatest names in our hobby's history and few would challenge the assertion that BHS is foremost in herpetological conservation and in herpetological science publication within the UK. Add to that an increasingly active and successful education programme aimed at the younger, up-&-coming herpetologists, not to mention a sound tradition of captive breeding, and all in the garden would seem to be froggy.

But there are problems. Mostly these arise from the singular fact that the BHS isn't rich enough to employ any full (or even part) time staff, and everything that happens is done by volunteers. Usually this at their own expense; a small but dedicated bunch of people shoulder all the responsibilities for finance, committee organisation, publications and so on. Members will no doubt realise that the Society's expanding activities over the past few years have put ever greater demands on these members of your Council and its associated committees.

In my estimation, the proper functioning of our Society – currently around 1,000 members – hinges on the health, well-being and commitment of only a dozen or so people. Many of these individuals have been around for a good few years and the Society owes them all a great debt – indeed its very existence depends on them. The low recruitment rate of new faces into the Offices of Council is not, however, a desirable state of affairs; indeed, it is a positively precarious one, rendering our activities vulnerable to the sickness, or departure for other reasons, of members of this tiny band of stalwarts.

So my point is this: we need new blood, more Members of the Society ready and willing to become involved in the running of it. Perhaps Council creates some kind of "in-crowd" image that deters Members from coming forward to join it; if so, accept my assurance that nothing could be further from the truth. We need to develop, as quickly as possible, a situation in which there is back-up to support existing Council members in times of strife or illness and, dare I say it, healthy competition for places on Council in future years. This is my plea: come forward, approach Monica or myself (phone numbers and addresses are in the back of the Bulletin), and get involved.

Trevor Beebee (Chairman)

A.S.R.A. SEMINAR ON ECOLOGY OF REPTILES AND AMPHIBIANS
SUNDAY 25th APRIL 1993

09.30 – 10.30	REGISTRATION AND COFFEE
10.30	Introduction
10.45	Mark **O'Shea,** The Ecology of cocoa waste dumps in Papua New Guinea
11.45	David **Galbraith,** Studies of the Life History and Ecology of Snapping Turtles
12.45 – 2.15	LUNCH
2.15	**Mike Linley,** Ecology of a Tropical Rain Forest Marsh in Costa Rica
3.15	**Chris Wild,** Herpetofauna of The Cameroon Highlands.
4.15 – 4.45	Tea and Biscuits
4.45 – 5.15	Discussion
	Contact Terry Thatcher or Richard Allen for details.

JOINT MEETING – SURREY WILDLIFE TRUST & B.H.S.

Title:	Leapers & Creepers
Venue:	Naver Wood Nature Reserve, Nr. Headley, Surrey. (On Leatherhead – Headley Road, B2033 Mill Lane)
Date:	Sunday April 4th 1993
Time:	10 am – 4 pm
Contents:	Displays, live Amphibians & Reptiles, Talks, Walks, Refreshments.

Car Parking Available.

Should anyone wish to offer (bring) specimens for display please could they contact me on 0737 643827.

Julia Wycheley

CORRECTION

Please note the following errors appeared in the article "A Note on the 18.5 ft. Boa Constrictor from Trinidad" by Hans Boos, published in the British Herpetological Society Bulletin No. 40, Summer 1992.

Page 15
Line 5 "races of" should read "races or".
Line 25 "framed" should read "famed".
Line 35 "Page" should read "Pope".

Page 17
Line 13 "was not visited" should read "has not visited".

MEMBERS' ADVERTISEMENTS

* Contact wanted with anyone breeding *Callopistes maculatus*, the Chilean False Tegn or Chilean Spotted Lizard.
Geoff Riley, Achates Cottage, Elm Drive, Stretford, Manchester M32 9AR.
Tel. 061 8651465.

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