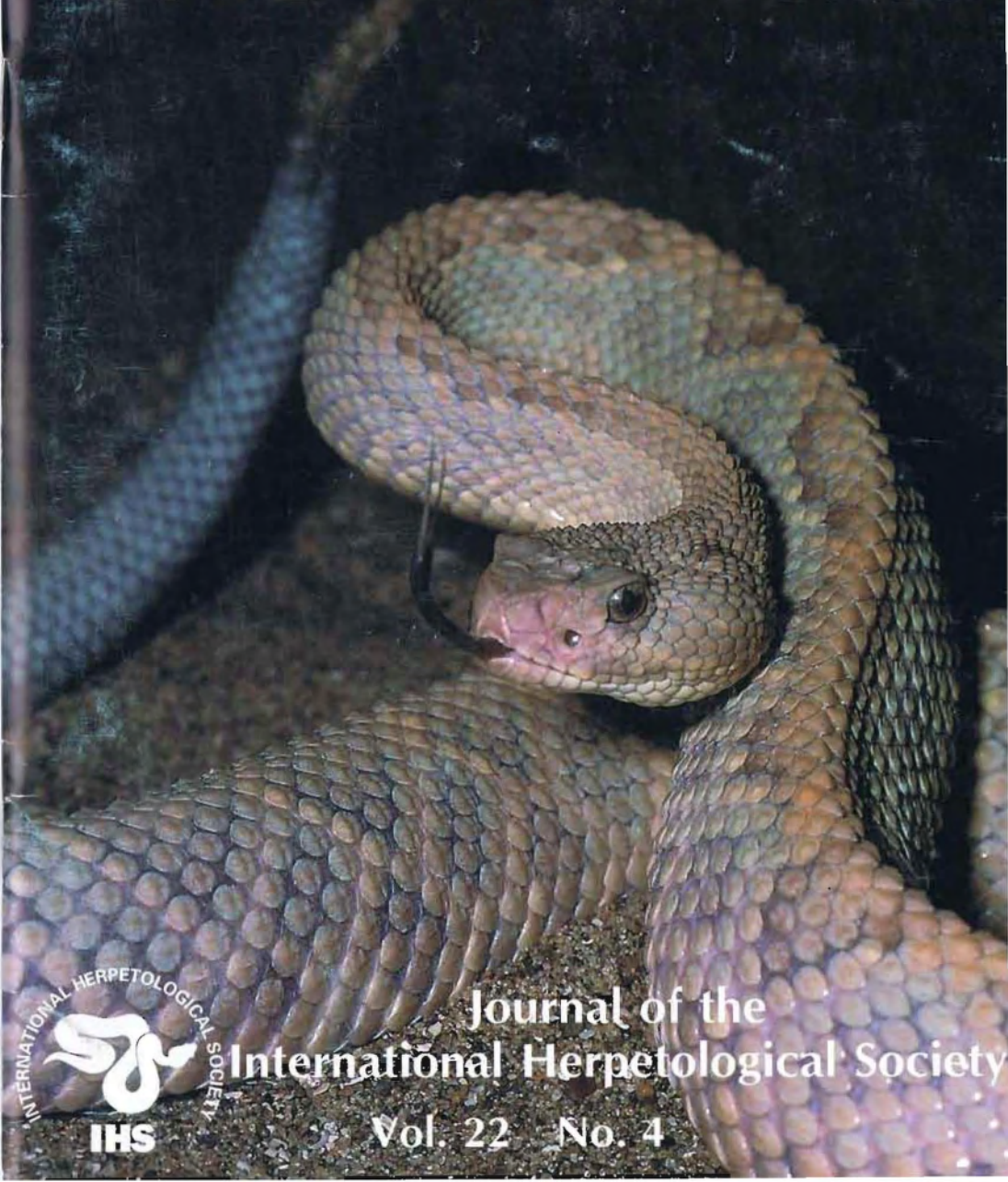


ISSN 0953—2021

THE HERPTILE



Journal of the
International Herpetological Society

Vol. 22 No. 4



Fig. 4; Aruba Island Rattlesnake, *Crotalus durissus unicolor*, (Sub-adult male). Photo by Mark O'Shea.



Fig. 5; Aruba Island Rattlesnake *C.d.unicolor* ('97 neonates: note different colour and tiny button rattle). Photo by Mark O'Shea.

The First UK Captive Breeding of the Aruba Island Rattlesnake.

Crotalus durissus unicolor.

Mark O'Shea, Curator of Reptiles,
West Midland Safari Park, Bewdley, Worcs., UK.

Background to the species and its' problems.

The tropical rattlesnake species, *Crotalus durissus*, occurs from Mexico to Argentina. It is a very wide-ranging species with 13 subspecies* (Dixon, Rage & Smith, 1993). Most are dark coloured snakes, found on the mainland of Central and South America, where they grow to large sizes approaching 2000 mm (Klauber, 1972). I have captured wild specimens approaching in excess of 1500 mm long in Brazil (*C.d.ruruima*) and somewhat smaller specimens in Guyana (*C.d.trigonicus*).

The Aruba Island rattler is a much smaller subspecies (formerly recognised as a valid separate species) of the tropical rattlesnake (max. length 950 mm - Klauber, 1972) and its name '*unicolor*' refers to its single pale yellow-lavender-grey ground colour with less distinct rhombic patterning and paravertebral stripes (McCranie, 1986). It grows to a maximum length of less than one metre (island populations are often either dwarfs or giants). Aruba Island is a small (184 sq. Km), fairly low-lying arid island situated 25 km off the north coast of Venezuela in the southern Caribbean.

Average yearly temperature is in the region of 27.5 °C and there is a short rainy season with an annual rainfall of 510 mm. It was formerly a Dutch colony, part of the Dutch Antilles, but it is now an independent country. Like many Caribbean countries it has discovered, and been discovered by, tourism. Hotels, casinos, redevelopment, destruction of the habitat, all follow and with them comes active destruction of the snakes, especially venomous snakes.

Very few Caribbean islands possess front-fanged venomous snakes: only Aruba, Islos de Testigos, Trinidad, St Lucia, Martinique and Roatan off the Honduran coast, but despite this fact, many Caribbean islands actively persecuted snakes so they could advertise they were 'snake free' and attract more tourists. Aruba Island is a small island and the rattlesnakes are now confined to only a few square miles of suitable habitat (McCranie, 1986; Hudson, 1984).

However, the 20th century is not entirely to blame for the loss of the habitat. Klauber (1972) reports that in pre-Colombian times Aruba Island was wooded but the forests were felled to provide charcoal and the ensuing soil erosion made reforestation impossible. Currently the habitat consists of cacti, windswept 'dividivi' trees and huge boulders which offer limited shelter to the rattlesnakes (Karen Bishop, pers. comm.), and other endemics such as the Aruba whiptail lizard, *Cnemidophorus arubensis*; Aruba leaf-toed gecko, *Phyllodactylus julieni*; and the Aruba false coral snake *Pliocercus arubricus*.

For over ten years the American Zoo and Aquarium Association have been involved in a conservation program to captive breed and re-introduce this threatened rattlesnake. Captive breeding of this taxa has previously been reported from US zoos (Kauffeld & Gloyd, 1939, and Carl, Peterson & Hubbard, 1982).

It took seven years to obtain licences to import some of the captive bred Aruba Island rattlers from the USA to expand the captive zoo population for breeding purposes. Last year the licences were granted and 20 specimens from different 'blood lines' arrived from Rotterdam Zoo, the European co-ordinator. Chester Zoo, the UK co-ordinator, invited London Zoo, Jersey Zoo and West Midland Safari Park to participate in the UK Aruba Island Rattlesnake program. Jersey Zoo was too committed to the Milos Viper. (*Macrovipera schweizeri*) project to take part. European zoos involved in the project include Rotterdam and Wassenaar Zoo's in Holland.

* Many recent authors (Liner 1994, Mattison 1996 etc.) may be unaware that Dixon, Rage & Smith (1993) removed the subspecies '*totonacus*' to the species, *Crotalus basiliscus* as *C.b.tofonacus* and at the same time transferred the subspecies '*oaxacus*' from *Crotalus basiliscus* to *Crotalus molossus* as *C.m.oaxacus*. Therefore the correct number of subpecies in *Crotalus durissus* is thirteen.

Maintenance at West Midland Safari Park.

In early December 1996 I travelled up to Chester Zoo to collect a number of Aruba Island rattlesnakes, part of a group of 20 captive bred animals which had arrived following several years of licence applications and Trans-Atlantic negotiations by Chester Zoo. I expected to receive five snakes but actually returned to WMSP with seven individuals, of three bloodlines, as follows:

Table 1

Aruba Island Rattlesnakes @ WMSP

Spec. No.	Sex	Date of Birth	Place of Birth
201	Male	27 / 05 / 91	Central Florida Zoo
180	Male	25 / 05 / 90	Central Florida Zoo
106	Female	24 / 04 / 86	Knoxville Zoo Tennessee
214	Male	16 / 04 / 91	Gladys Porter Zoo, Texas
215	Male	16 / 04 / 91	Gladys Porter Zoo, Texas
216	Male	16 / 04 / 91	Gladys Porter Zoo, Texas
217	Male	16 / 04 / 91	Gladys Porter Zoo, Texas (deceased 06/08/97)
97/1	Undetermined	21 / 05 / 97	West Midland Safari Park
97/2	Undetermined	21 / 05 / 97	" " " "
97/3	Undetermined	21 / 05 / 97	" " " "
97/4	Undetermined	21 / 05 / 97	" " " "
97/5	Undetermined	21 / 05 / 97	" " " "
97/6	Undetermined	21 / 05 / 97	" " " "
97/7	Undetermined	21 / 05 / 97	" " " "

Chester and London Zoo's shared out the remaining rattlesnakes from four bloodlines.

All the snakes we received at WMSP were reportedly feeding on dead mice and this proved to be the case as they all fed willingly and easily on 21st December and continued to feed well (with the exception of 217) with only the occasional refusal due to an individual coming into a pre-ecdysis condition.

The Central Florida and Knoxville snakes (all large adults were initially housed off-show in the Q. Room, as a group in a cage measuring 85 mm x 45 mm x 40 mm on newspaper with a hide box and waterbowl. The four Gladys Porter snakes, also in the Q. Room, were each housed separately in cages 25 mm x 45 mm x 25 mm on newspaper with a water bowl and a clay snake dome (Dinosaur Nutrition), with access to individual underfloor chambers comprising a cat-litter tray. 214 always remained 'above ground', 215 and 216 always remained 'below ground' but with their heads visible below the entrance hole and 217 fluctuated between the two areas.

Although Carl et al (1982) provided their snakes with Vita-lite illumination the snakes held in the Q. Room at WMSP were only illuminated by the room lights. Since rattlesnakes are commonly crepuscular the low light conditions were considered sufficient for their off-show maintenance. The snakes experienced a photo-period varying from 9L : 15D to 11L : 13D compared to 14L : 10D of Carl et al.

Breeding at West Midland Safari Park.

Courtship and copulation were observed between a male (180) and the female (106) on 10th January 1997 and briefly again on 5th March. Soon after the female appeared to be putting on considerable girth posteriorly and was believed to be gravid despite the fact that she continued to feed.

The Central Florida males were moved out onto display just prior to Easter due to press and public interest leaving the female undisturbed in her Q. Room cage. She gave birth to seven neonates during the night of 20th/21st May. It seems likely that the birth originated from the January mating suggesting gestation period of approximately 130 days (or 76 days for the March mating). Copulation's reported by Klauber (1982) and Carl et al (1982) took place in September and October with births from April to June which would suggest extremely long gestation periods unless the females were retaining the sperm for up to five months before fertilising their ova. It is also possible, of course, that this rattlesnake experiences an extended gestation period and our female was already gravid when she arrived but in view of the mating activity and subsequently gravid females in three UK zoos I am inclined to believe that the birth occurred due to the observed January copulation. Only continued breeding and observation can begin to answer that question.

After parturition the female was fed and moved into the display cage and in September 1997 a short period of courtship and possible copulation was observed between male 180 and female 106.

Seven neonates appears to be an average litter size for *C. durissus unicolor*. Fitch (1985) quotes a range of 2-14 for this small insular rattlesnake whilst larger mainland Latin American rattlesnakes produce from 10-47 neonates in a litter. Obviously, as Fitch suggests, litter size is a direct response to the size of the adult female snake. Six of the neonates were somewhat darker than the adults and I considered that they could easily have been mistaken for young mainland Venezuelan *Crotalus durissus cumanensis*. The other specimen (97/1) was much lighter, almost a sandy colour. The sex ratio of the neonates was 3.4. males the tails (TL) are significantly longer (c.40%) in relation to snout to vent length (SVL) and total length (TTL),

i.e. males (n=3) SVL = 270 mm; TTL = 300-305 mm; TL = 30-35 mm
females (n=4) SVL = 275-290 mm; TTL = 300-315 mm; TL = 25 mm

To this date (October 9th) five juveniles are taking new-furred mice voluntarily but two are still being assist-fed thawed pinkie mice once a week. I have little doubt that these two will soon begin to feed of their own accord.

It will be noticed from Table 1 that the Gladys Porter Zoo specimen 217 is deceased. We noted an apparent problem with this animal in mid July. It fed along with its siblings on 5th July but then persistently refused to take food offered on 12th, 19th and 20th July, despite showing initial interest.

There were no other outward signs of illness and bearing in mind that this was a highly venomous snake there is a limitation to the amount of manipulatory examination that can be performed.

217 was found dead on the morning of 6th August, while I was in Prague attending the 3rd World Congress of Herpetology, and my colleagues dispatched it to Chris Marshall (veterinarian to WMSP Reptile House) for a post mortem. Histological examination of the liver revealed necrosis and inflammation and secondary pneumonia was diagnosed from the lungs. Cause of death was recorded as liver disease with secondary pneumonia and it was determined that there would have been nothing that could have been done to diagnose or treat this snake in order to prevent its death.

Although WMSP were the first to produce young Aruba Island rattlesnakes it must be realised that Chester and London Zoo also have gravid females - six were born at Chester but London only had a single live neonate born. Despite London's misfortune it seems that the captive population of this, the rarest of rattlesnakes, is set to become quite large in the UK. One of our males (No. 201) and surplus adults from Chester and London Zoo's have now left for Rotterdam Zoo for onward transport to Wassenaar Zoo.

References:

- Carl G., K.L.Peterson & R.M.Hubbard 1982 Reproduction in captive Aruba Island rattlesnakes, *Crotalus unicolor*. Herp. Review **13**(3): 89-90.
- Dixon J.R., J-C.Rage & H.M.Smith 1993 *Crotalus* pp.53-76 in Golay et al (eds.) *Endoglyphs and Other Major Venomous Snakes of the World: A checklist*. Azemiops, Geneva, Switzerland.
- Fitch H. S. 1985 Variation in clutch and litter size in New World reptiles. *Univ. Kansas Mus. Nat. Hist.. Misc. Pub.* **76**:1-76
- Hudson R.1984 A species survival plan (SSP) and its application to reptiles. p.1-9 in Tolson (ed.) *7th Annual Reptile Symposium on Captive Propagation and Husbandry*. Zool. Consortium Inc., Thurmont, Maryland.
- Kauffeld C.F. & H.K.Gloyd 1939 Notes on the Aruba rattlesnake, *Crotalus unicolor*. *Herpetologica* **1**(6):156-160.
- Klauber L.M. 1972 *Rattlesnakes: Their habits, life histories and influence on mankind*. Univ. Calif. Press, Berkely and Los Angeles Vols. 1 & 2.
- Liner E.A. 1994 *Scientific and common names for the amphibians and reptiles of Mexico in English and Spanish*. SSAR. herp. circ. 23.
- Mattison C. 1996 *Rattler! A natural history of rattlesnakes*. Blandford.
- McCranie, J.R. 1986 *Crotalus unicolor* van Lidth de Jeude: Aruba island rattlesnake. *Cata. Amer. Amph. Rept.* **389**:1-2.