

2001 NSS Convention

A Cave Odyssey

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Program Guide



Editor
H.J. Kalnitz

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DEDICATED TO THE EXPLORATION, STUDY AND CONSERVATION OF CAVES

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Biology (cont.)

Replacement of the Troglomorphic Population of *Rhamdia quelen* (Pisces: Pimelodidae) by an Epigean Population of the Same Species in the Cumaca Cave, Trinidad, W.I. (Poster)

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In 1926 the cave fish population in the Cumaca Cave of Trinidad, W.I., was described as a new troglomorphic genus and species, *Caecorhamdia urichi*, due to its reduction in eyes and pigmentation. Later studies indicated that this was just a cave population of the widely distributed epigean form of *Rhamdia quelen*. Beginning in the 1950's a number of specimens were collected in the cave showing variability in eye size and pigmentation. In 2000 and 2001 we conducted field studies that included direct observation of individuals using infrared equipment (video cameras and night-vision goggles), fish echo-sounders, and collecting. We also studied all available specimens of the cave population that have been deposited in museums. Our results strongly suggest that the troglomorphic population has been completely replaced by an epigean one in a period of time as little as 50 years. We hypothesize that some of the reasons for this replacement included, but are not limited to, a new and continuous gene flow from the surface population into the cave one and the preadaptations to nocturnal life among individuals of the cave population of *R. quelen*.

Communications and Electronics

Monday 12:00 - 3:00 p.m.

ROCK II A New Remote Video Probe For Caves

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I presented a design in 1996 for a remote CCD TV camera, called ROCK. This Remote Operated Cave Kinescope was utilized in several caves and potential digs, to view deep in-

side cracks to determine whether human penetration was worthwhile or even safe. ROCK had at least one shortcoming, the aluminum poles which were tapped and threaded on end, and screwed together for extension. After loosing this camera in Cottonwood Cave when the threads broke, I improved on the design to lighten the unit, and use a tent pole with a bungee cord for the extension pole.

The new design is much lighter and smaller but has less protection from the cave. Best of all, it cost less the second time around. This talk will demonstrate ROCK II, and some examples of its versatility will be shown on the screen.

Replacement of the troglomorphic population of *Rhamdia quelen* (Pisces: Pimelodidae) by an epigean population of the same species in the Cumaca Cave, Trinidad, W.I.

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Abstract

In 1926 the cave fish population in the Cumaca Cave of Trinidad, W.I., was described as a new troglomorphic genus and species, *Careochanna urichi*, due to its reduction in eyes and pigmentation. Later studies indicated that this was just a cave population of the widely distributed epigean form of *Rhamdia quelen*. Beginning in the 1950's a number of specimens collected in the cave exhibited variability in eye size and pigmentation. In 2000 and 2001 we conducted field studies that included direct observations of individuals using infrared equipment (video cameras and night-vision goggles) and fish echo-sounders, and also collected some individuals. We studied all available specimens of the cave population that have been deposited in museums. Our results strongly suggest that the troglomorphic population has been completely replaced by an epigean one in its little as fifty years. We hypothesize that some of the reasons for this replacement included, but are not limited to, a new invasion of epigean individuals of *R. quelen*, but because of their size and predilections to nocturnal life, out-competed troglomorphic individuals. Rainfall regime changes may have induced the invasion of the cave by epigean individuals.

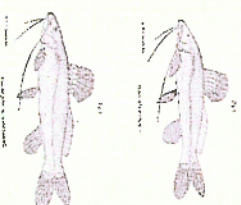
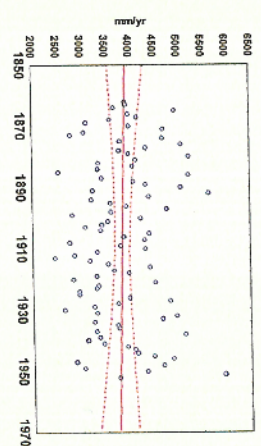


Table 1. Individual and specimens omitted from the Cumaca cave. The term individual is used for those that were observed and measured while still alive. Specimens for data in museum collections.

Year	Source	SL (mm)	Condition of Eyes	Eye Not Visible	Normally Pig.	Partially Pig.	Depigmented
1926	BANHI 1926.7.28.1	97.43	1	1	1	1	2
1959/4	BANHI 1926.7.28.2	110.0	1	1	1	1	2
	6 fish, J. Kenney, pers comm*	150 - 200	3	3	2	2	2
1977	ROM 48113.A	133.6	1	1	1	1	1
1966	ROM 48113.B	133.6	1	1	1	1	1
	ROM 48113.C	133.6	1	1	1	1	1
	note (Olsen 1974)	200	1	1	1	1	1
	pub (Olsen 1974)	240	1	1	1	1	1
1967	UWI 47	88.29	1	1	1	1	1
1982	BANHI 1982.9.11.30	92.82	1	1	1	1	1
	BANHI 1982.9.11.31	92.82	1	1	1	1	1
	BANHI 1982.9.11.32	104.49	1	1	1	1	1
	BANHI 1982.9.11.33	106.32	1	1	1	1	1
	BANHI 1982.9.11.34	108.75	1	1	1	1	1
	BANHI 1982.9.11.35	116.01	1	1	1	1	1
	BANHI 1982.9.11.36	121.13	1	1	1	1	1
	BANHI 1982.9.11.37	122.85	1	1	1	1	1
	BANHI 1982.9.11.38	135.17	1	1	1	1	1
1987	UWI 487	124.9	1	1	1	1	1
2000	20+ individuals observed (Romero & Creswell 2001) variable		20		20		
2001	UWI 2001.1	182.0	1	1	1	1	1
	UWI 2001.2	256.0	1	1	1	1	1
	UWI 2001.3	267.0	1	1	1	1	1
	UWI 2001.4	207.0	1	1	1	1	1
	UWI 2001.5	213.0	1	1	1	1	1
	UWI 2001.6	219.0	1	1	1	1	1
	UWI 2001.7	227.0	1	1	1	1	1
	UWI 2001.8	227.0	1	1	1	1	1
	UWI 2001.9	239.0	1	1	1	1	1
	UWI 2001.10	239.0	1	1	1	1	1
	UWI 2001.11	254.0	1	1	1	1	1
TOTALS			38	17	42	9	4



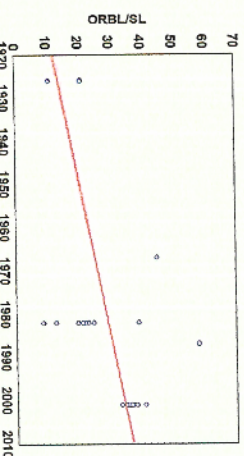
Rainfall Data for Trinidad 1852-1952



Table 2. Ratio of left orbit (ORBL) and SL among all specimens examined.

Specimen	SL (mm)	ORBL (mm)	ORBL/SL (X 1000)
BANHI 1926.7.28.1	97.43	2.01	20.63
BANHI 1926.7.28.2	110.0	1.16	10.55
UWI 47	89.29	3.98	44.57
ROM 48	133.6	3.00	22.46
BANHI 1982.9.11.30	92.4	2.24	24.24
BANHI 1982.9.11.31	99.62	2.25	22.59
BANHI 1982.9.11.32	105.49	2.04	19.34
BANHI 1982.9.11.33	106.32	4.10	38.56
BANHI 1982.9.11.34	108.75	2.46	22.62
BANHI 1982.9.11.35	116.01	2.5	21.55
BANHI 1982.9.11.36	121.13	2.52	20.80
BANHI 1982.9.11.37	122.85	1.52	12.37
BANHI 1982.9.11.38	135.17	1.25	8.29
UWI 487	124.9	7.2	57.65
UWI 12001.1	182.0	6.85	37.64
UWI 12001.2	206.0	6.63	35.27
UWI 12001.3	207.0	7.88	36.80
UWI 12001.4	213.0	8.17	40.43
UWI 12001.5	219.0	7.71	36.20
UWI 12001.6	222.0	7.51	34.29
UWI 12001.7	222.0	7.88	35.18
UWI 12001.8	227.0	7.54	34.71
UWI 12001.9	239.0	7.84	34.98
UWI 12001.10	239.0	7.84	32.80
UWI 12001.11	254.0	9.04	35.59

Changes in the ORBL/SL Ratio Through Time 1926-2001



*numbers distinguished arbitrarily