

Results (BPb levels $\mu\text{g/g}$)

	2010			2019
	Kosi Bay	Ndumo	St Lucia	St Lucia
	3	3	3	9
	3	3	4	10
	8	3	8	11
	8	3	8	11
	10	3	12	12
		6	16	14
		6	18	14
		8	20	15
		10	26	32
		16	28	36
		18	32	43
			42	46
			64	72
			64	88
			126	110
			280	116
			344	125
			960	651
				690
				968
				1121
				1311
MEAN	6.4	7.2	114.2	250.3
SD	3.2	5.4	231.8	408.0



Discussion

- 64% of the sample had elevated BPb ($>10 \mu\text{g}/\text{dL}$)
- The four highest recorded BPb values in any study are crocodiles from St Lucia
- Sediment samples around the lake tested with XRF device
- Coal mines do contaminate soil with Pb, but often at low levels

Discussion

- We attribute the elevated BPb levels observed at Lake St Lucia to the widespread and longstanding recreational use of Pb fishing sinkers & drop shots



Pb STUDY - ZULULAND



Photo: X Combrink

Pb STUDY - ZULULAND

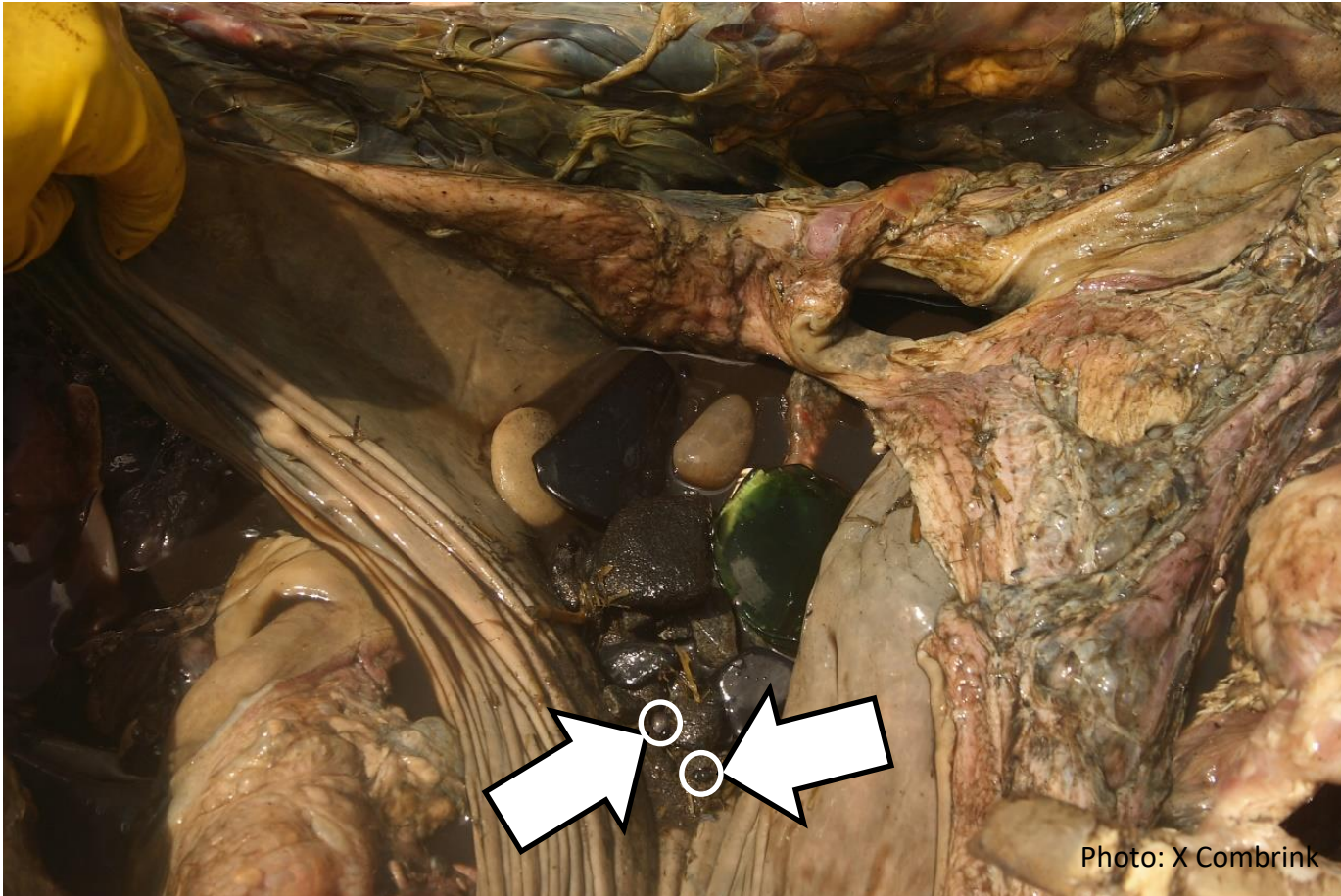


Photo: X Combrink

Discussion

- Crocodiles swallow Pb sinkers through normal gastrolith acquisition and theft of fishing bait or drop shots
- Gastroliths are used for the maceration of food in the highly acidic ($\text{pH} < 2$) stomach
- The small pylorus valve in stomach retain gastroliths (Pb sinkers), preventing them from passing into the duodenum and being excreted as waste
- Pb sinker dissolve for several months & Pb released & continually absorbed into the blood (red blood cells), then soft tissue & organs (especially the kidney and liver) & finally in bone
- The results of Zululand show Pb intoxication, but we cannot adduce clinical significance
- At time of capture none of the crocodiles had any observable signs of physical attrition, deformation, or abnormal behaviour compared with other individuals captured

Discussion

- Although adults may tolerate elevated Pb body burdens, there are evidence that female crocodilians shunt Pb into egg shells and developing embryos, leading to deformities or death
- Overall sex related differences in BPb were 13.8 fold in our study
- Likely that low BPbs observed among breeding-aged females could be attributed to mothers passing Pb body burdens off to the eggs shells and embryos
- The increase in BPB from 114.2 $\mu\text{g}/\text{dL}$ (2010) to 250.3 $\mu\text{g}/\text{dL}$ (2019) is concern
- Noticed teeth loss with some individuals

Discussion

- While adult Nile crocodiles may be tolerant to elevated levels of contaminants, chronic effects on reproductive health and embryo development are of particular concern
- Research aimed at addressing these issues is planned for later in 2020
- Future crocodile research efforts in other populations in South Africa
- Existing Pb sinkers may persist in environment many years
- Replace Pb sinker with steel weights