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Report on the Lethal Effect of House-Hold Paints on Amphibians in Rivers State, Nigeria

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Abstract: **The lethal effect of house-hold paints on the adult forms of the African tiger frog, *Hoplobatrachus occipitalis*, is hereby reported. The specimens which were collected from a gas flaring community in Rivers State (Nigeria), were accidentally kept in a perforated paint bucket for about 12 hours. They were found dead with their internal organs completely digested. The indiscriminate disposal of used house-hold paints and other chemicals into the environment is discouraged as they could pose great danger to both adult and larval stages of some wildlife species.**

Keywords: **lethal, house-hold, paints, amphibians.**

I. INTRODUCTION

Amphibian declines, deformities and malformations have been the subject of many researches in recent times [1], [2]. Amphibians are considered to be the most threatened taxa of the Phylum Vertebrata [3]. The factors responsible for their declines include infectious diseases, like chytridiomycosis [4], trematode infections, such as *Ribeiroia ondatrae* [5] and *Acanthostomum burminis* [6], chemical pollution [7], use of fertilizers and pesticides that may lead to eutrophication [8]. Climate change [9] and changes in temperature [10] have also been implicated. The developmental stages of amphibians are those most adversely affected by toxic chemicals and have been employed in most ecotoxicological studies, as against the use of adult specimens [11].

In Nigeria, most research on amphibian ecology have been centred on species diversity and parasitic infections [12], [13]. However, a few others [14], [15] have identified some factors as being responsible for declining amphibian populations in the Niger Delta. The factors included the following: incessant spillage due to burst of oil pipelines and pipeline vandalism which causes the introduction of considerable quantities of petroleum hydrocarbons into amphibian breeding sites, leading to the mass death of eggs and tadpoles, pesticides, reclamation of wetlands for housing and road projects, habitat alteration and fragmentation as well as consumption of the edible species by man.

This paper reports the possible role of indiscriminate disposal of left-over household paints in the death and decline of mature amphibian species.

II. MATERIALS AND METHODS

Specimens of the African tiger frog, *Hoplobatrachus occipitalis*, were hand captured using the visual encounter and acoustic survey method at night, between the hours of 7.00 to 10.00pm, for use in parasitology studies. This was done in September, 2016, at Agbada (E 4^{o} $55^{'}$ 57.006'', N 7^{o} $1^{'}$ 13.692$^{''}$), a gas flaring community in Rivers State, Nigeria. They were transported to the parasitology laboratory in Rivers State University of Science and Technology for the survey of their internal helminth parasites within 12 hours of capture.

III. RESULTS AND DISCUSSION

It was observed that on getting to the laboratory all the frog specimens, measuring mean snout-vent length, 9.25 cm ± 3.11cm and mean total body weight, 68.5g ± 10.5g, had died. This was rather startling because the said species are hardy and can survive long hours of capture. When they were dissected, it was observed that all the internal organs had been digested into a dark coloured, jelly-like substance.

Further investigations led to the finding that a local assistant had kept the frog specimens in a paint bucket through the dark night hours for safety. The content (that is, paint) of the bucket had just been used up a few days before the survey was conducted and it had not been washed clean of the chemical. Notably, also although the lid was perforated to permit exchange of gasses, all the frogs died.

Paints usually contain the volatile organic compounds (VOCs) toluene, xylene, ethyl benzene [16], Cu and Zn which have been shown to be toxic to crustaceans, macroalgae and bacteria [17]. Mercury has been detected in many household products, such as latex (water-based) paint due to its antifungal and antibacterial properties [18]. In the same vein, it has been reported that tributyltin used in interior paints posed a health hazard [19].

It had been reported that some inhabitants of parts of the Niger Delta washed off substances like used engine oils and other petrochemicals into fresh water bodies [14], [15]. Most of the car wash services were also located close to fresh water bodies which are important breeding sites for amphibians. Remains of paints are also commonly washed off into the environment without considering the possible adverse effects they may have on amphibians and other life forms. The present report is therefore important as it reveals the adverse, even lethal effect such unwholesome habits could have on the adult stages of amphibians, and much so, on the larval forms.

IV. CONCLUSION

In conclusion, paints and associated products should be used cautiously and disposed properly to avoid contamination of the environment and possible death of simpler life forms. Most chemical products made for domestic and industrial purposes, including paints, contain substances that pose serious health risks to humans and lower animals. Such products should be disposed according to the appropriate regulations, and defaulters should be punished appropriately. Individuals who are in the habit of consuming legs and whole body of *Hoplobatrachus occipitalis* and other edible frog species, such as *Ptychadena* species, should be warned of the danger of bio-accumulating heavy metals and other poisonous chemical substances which have been absorbed by the frogs from the already polluted environment. It is also recommended that appropriate agencies should test and certify paints before they can be sold for public use.

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