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Exploding Swamp Dragons

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Abstract

A personal favourite pet of the noblemen and women, *Draco vulgaris*, more known as swamp dragons, are small flying dragons. These dragons consume a range of objects that have combustible capabilities this allows them to produce flames. A consequence of this is that the dragon has a habitat of exploding due to indigestion or over-excitement. The paper discusses the possible reasons that the dragons explode and the chemicals that may be involved.

Keywords: *Book; Biology; Swamp dragons; Ketosis; Human combustion; Discworld; Terry Pratchett*

Introduction

Swamp dragons, *Draco vulgaris* [1], (figure 1) are small dragons that are first mentioned in the novel 'Guards! Guards!' [2]. They inhabit the swamps of the Discworld a world that is flat and held up by four elephants that are standing on a turtle's back. The swamp dragons can be found in the swamps of the Discworld. This habitat is unsuitable for them as there is a lack of combustible material to be eaten. This is needed as the animals use the flames to incubate their eggs, fight off predators, impress potential reproductive mates and to show off when they are bored [3]. Things the dragon will eat include alcohol, coal, wood, even objects like kettles are eaten. An example is seen when a dragon ate all of Captain Vine's household items [4]. To process such a diet, swamp dragons can rearrange their internal organs like guts, stomachs and other digestive tubes, this also contributes to them being able to create the hottest flame possible. As a result of their diet, swamp dragons tend to be permanently ill. The Sunshine Sanctuary for Sick Dragons by Rosie Devent-Molei and Lady Sybil is dedicated to housing abandoned dragons. Due to a highly inflammable diet a dragon is vulnerable to exploding due to ingestion (a common occurrence) or when they are over-excited [3].

Hence, I will look at different ways the body of the dragon could cause it to explode like the mixing of chemicals in the stomach and spontaneous human



Figure 1 – Errol the Swamp dragon. The pet of Lady Sybil [5] (Original artist: Paul Kidby).

combustion.

Indigestion

Indigestion occurs when acid from the stomach irritates the stomach lining of your throat. Symptoms for humans include bloating and heartburn [6]. These symptoms may also be appropriate with the addition of exploding as the dragons consume some very acidic substances that may irritate them. In a dragon stomach the acids are present as the dragon has to breakdown a variation of material from wood to metal. Alcoholic substances are also ingested and if they aren't fully digested, they begin to accumulate. This accumulation could result in the nitric acid mixing with the alcohol creating nital, a highly explosive substance if in high concentrations [7]. This build-up of nital could result in an exploding dragon.

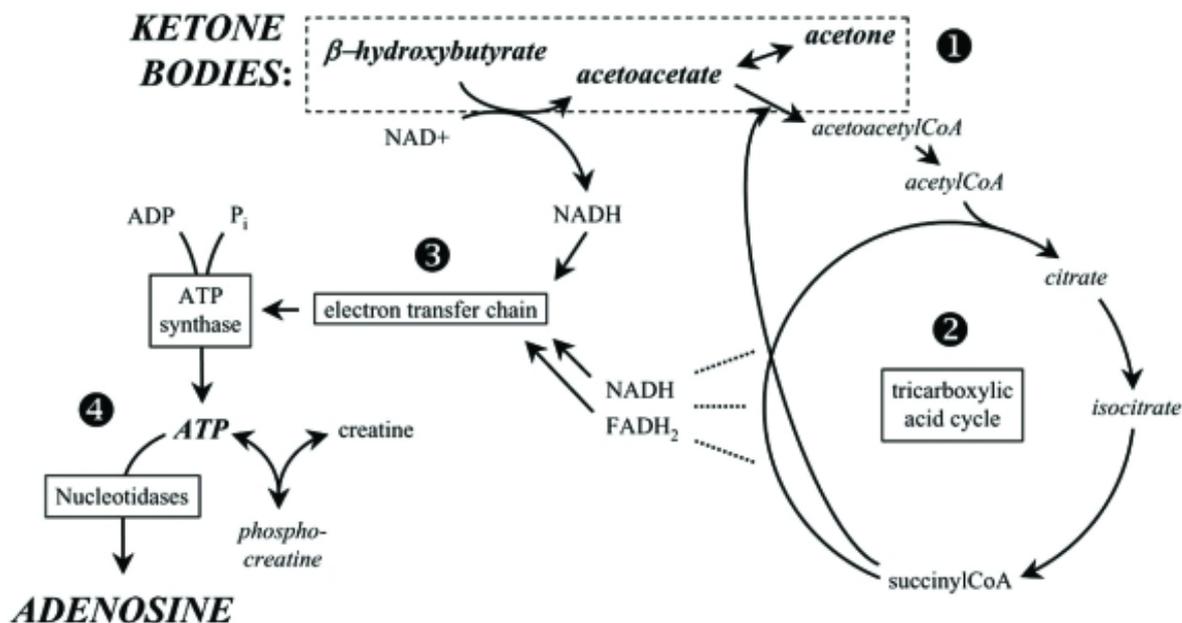


Figure 2 – The pathways of ketosis. It can either lead to the creation of adenosine or acetone a flammable substance. This pathway might be a possibility as to why the swamp dragons explode (figure taken from [9]).

Spontaneous Human Combustion

A phenomenon known as spontaneous human combustion has occurred, this is where a person dies from fire that has no external source of ignition [8]. As dragons explode due to internal mechanisms a possible explanation for human combustion may be applicable. A theory about how this may occur is through ketosis (see figure 2). In the body triacylglycerol lipid cleaves to form fatty acids and glycerol. This provides an alternative source of energy for the kerbs cycle within the mitochondria cells. When cells have low levels of glucose the acetyl-CoA in the liver is converted into acetoacetate which is then decarboxylated into the highly flammable chemical acetate. This can be induced by high levels of alcohol intake, which is seen in the swamp dragon as they like to eat and drink flammable substances [10].

Over-excitement

Another way swamp dragons may explode is through being too excited. A neurotransmitter that could be

involved is serotonin. Serotonin is responsible for mood, memory, sleep, temperature regulation and various other functions. Having too much serotonin can lead to shivering and diarrhoea and in more extreme cases fever and seizure. The fever can reach a high of over $104\text{ }^\circ\text{C}$ [11]. The high body temperature the dragon might experience may lead to the dragon exploding as the sensitive flammable products in the dragon body may ignite.

Conclusion

Overall swamp dragons are famous for their explosive capabilities due to over-excitement or indigestion. There are several mechanisms this may occur from for example the mixing of alcohol and nitric acid, spontaneous combustion caused by ketosis and a high fever caused by an overdose in serotonin.

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