

MINERAL CHARACTERISTICS OF TROPICAL SALT LICKS IN SARAWAK, THE NORTHWEST OF BORNEO ISLAND

SIONG FONG SIM*¹, JAYASILAN MOHD AZLAN², NURUL ASNA HIDAYAH MIOR ABDUL RAHMAN², SAMUEL LIHAN² AND PEI LING KANG¹

¹Faculty of Resource Science & Technology, ²Institute of Biodiversity and Environmental Conservation, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia.

*Corresponding author: sfsim@unimas.my

Submitted final draft: 2 May 2020

Accepted: 24 May 2020

<http://doi.org/10.46754/jssm.2020.12.005>

Abstract: Animals lick at the salt lick for mineral supplements. There is no scientific information available on the mineral compositions of salt licks in Sarawak. This paper reports the concentrations of Na, K, Mg and Ca in salt licks of Sarawak and their horizontal variability. Soil samples were collected from nine salt licks and at a distance of 100 – 500 m away. The samples were digested and analysed using an atomic absorption spectrophotometer. Samples from a non-salt lick site were also analysed, serving as the control. The concentrations of Na (nd – 136 mg/kg), K (454 – 1834 mg/kg), Ca (nd – 1017 mg/kg) and Mg (450 – 3627 mg/kg) in the nine-salt licks varied considerably. The sites observed with sodium craving species (leeches and butterflies) were confirmed with profound Na (90 – 117 mg/kg), higher than that in the control (45.65 mg/kg). The mineral concentrations in the salt licks were reduced as the horizontal distance increased. At 500 m, the mineral concentrations in most salt licks were found below the control. The findings in this study can be used to recommend a suitable buffer distance for wildlife conservation and sustainable management of the salt lick deposits in this region.

Keywords: Sustainable management, horizontal variability, sodium-craving behaviour.

Abbreviations: Na, K, Ca, Mg, PCA

Introduction

Salt licks are places rich in essential minerals where animals regularly visit to lick the soil/water to supplement their diet. Animal footprints have been consistently captured at these natural deposits substantiating their importance to the animals. At salt licks in Deramakot Forest Reserve, Sabah, footage of 40 species was found with mammals being the most dominant group of animals observed. Some endangered species such as Asian elephant and Orangutan were also spotted (Matsubayashi & Lagan, 2014). The species diversity and frequency of animal visitation usually depend on the habitat nature, dietary needs, seasonal movements and reproductive activity of the animals. Lactating female mountain goats visit salt licks for Na supplement because their diet of alpine vegetation is low in Na; the salt licks also provide Mg to offset their high dietary K intake (Poole *et al.*, 2010). On the other hand,

some wild herbivores lick from the deposits for detoxification of elements that are widespread in their habitats or taken up through ingestion (Panichev *et al.*, 2017).

Salt licks are commonly characterised with elevated sodium (Na), potassium (K), calcium (Ca), magnesium (Mg) and possibly other elements such as nitrogen (N), phosphorus (P), iron (Fe), copper (Cu), zinc (Zn) and chloride (Cl⁻) (Holdo *et al.*, 2002; Brightsmith & Aramburu, 2004; Matsubayashi *et al.*, 2007; Mills & Milewski, 2007; Powell *et al.*, 2009). As reported by Ramachandran *et al.* (1995), the mineral contents in salt licks can be 3 - 4 times higher than that found at the control site. The abundance of minerals may vary considerably, even in salt licks from similar geographical background; for example, the concentration of Na in five salt licks of the Amazon Basin could range from as low as 29 mg/kg to 1361 mg/kg (Molina *et al.*, 2014).