

Molecular Phylogeography and Clinical manifestations of Russell's viper (*Daboia russelii*) in Sri Lanka

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The Russell's viper, *Daboia russelii* has a relict distribution over large areas of Indian Sub Continent, Taiwan and the Lesser Sunda islands. Russell's viper is distributed with varying densities and occurrence throughout many natural and modified habitats in Sri Lanka. Bite of this species is associated with a high incidence of morbidity and mortality in Sri Lanka. There is scanty of information available about Russell's viper in Sri Lanka. Thus, preliminary study was carried out using clinical data obtained from the twenty eight patients admitted due to Russell's viper bite in General Hospitals in the Gampaha District. Further, thirty five DNA samples were collected from the tail tip of specimens of the Russell's viper from Gampaha, Kandy, Rathnapura, Galle, Anuradhapura and Kurunagala districts for molecular phylogeny. Then fragment of mtDNA sequencing fragments of cytochrome b genes were amplified. PCR and products were subjected. DNA sequencing for molecular analysis using raxmlGUI software.

Results revealed that the clinical features following Russell's viper envenomation are follows; local swelling 86%, local necrosis 7%, coagulopathy 75%, neurotoxicity 32%, nephrotoxicity 14% and cardiac effects 3%. Mortality of Russell's viper bites are caused by complications like renal failure, neurotoxicity, respiratory failure, disseminated intravascular-coagulation, heart failure and other cardiotoxic effects.

Alignment of Sequences of Cytochrome-b gene by maximum likelihood analysis revealed that two strongly supported monophyletic clades corresponding to Sri Lanka and the Indian subcontinent. However, Sri Lankan Russell's viper was nested within the clade of Indian Russell's viper group. There was genetic divergence (2%) between the Indian clades and the Sri Lankan clade. However, these haplotypes do not show any geographically significant pattern. Thus, it could be suggested that Indian and Sri Lankan Russell's viper are genetically closely related and origin may be India or Sri Lanka. Further studies are being carried out on morphometric, molecular taxonomic and venomous differences in different geographic location within the Sri Lanka and Asian region.

Keywords: Cytochrome-b gene, mtDNA sequencing, envenomation

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