

## ABSTRACT

Latent fingerprints(LFPs) play crucial role in the crime scene investigation. Powder dusting method is considered as one of the most important method to develop LFPs on various porous and non porous surfaces. Chemical based latent fingerprint powders are comprises of heavy metals such as lead and mercury so these powders are hazardous for law enforcement officials and forensic scientists. This research aimed to green synthesis of the LFPs powder that would be safe and cost effective as well as comparable quality to the powders already being used by forensic scientists. Four black powders were prepared from four different plant materials; *Desmostachya bipinnata* (Khus grass), *Oryza sativa* (Rice palnt), *Musa acuminata* (banana ) and *Ficus carica* (Fig) using the method reported by Gaddam et al. (2015). The results of the latent prints were compared with the **Sirchie black** and **Sirchie magnetic** fingerprint powders on various surfaces. Remarkably, all of the four plant-based powders exhibited exceptional results on various surfaces such as paper, glass, plate, metal and plastic in terms of ridge clarity, low background noise on surface and durability on various temperature. Notably, the powder derived from *Desmostachya bipinnata* demonstrated the potential for practical application in the field during crime scene investigations as any other black powder being used.