IDENTIFICATION AND RECOVERY OF FINGERPRINTS FROM GLASS FRAGMENTS IN MOLOTOV COCKTAIL CASES

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Specially dedicated to my beloved family

Ku, Mak, Nadia, Burhan, Fatin and Syafiq. Thank you for your love and support.

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ABSTRACT

Increasing reports on Molotov cocktail cases in the local media has warrant a need for a detailed investigation of the perpetrator of the crime. A study is therefore embarked to compare fingerprint quality recovered from glass fragments of Molotov cocktails. The accelerants used were petrol, kerosene, diesel and motor oil. Different types of accelerant were used to observe the effect of accelerant on the quality of fingerprint recovered from glass fragment of Molotov cocktails. In the study, Molotov cocktails were exploded and glass fragments bearing fingerprint marks were collected and transported back to laboratory for analysis. Prior to fingerprint analysis, soot were removed from glass fragment using three techniques of brushing, NaOH (2 %) wash solution and tape lifting. After soot removal, enhancement fingerprint were done by using methods such as dusting method, superglue fuming method and Small Particle Reagent (SPR) method. Then, fingerprints from glass fragment of Molotov cocktails were identified by manual matching. Powder dusting method was used for sample petrol only because most of glass fragment were obtained in dry condition. Other than that, superglue fuming method was used in majority of sample whether Molotov cocktails were allowed to burn out naturally or the fire was extinguished using water. Small particle reagent method was mostly used for the wet glass fragment. Fingerprints recovered were photographed and were sent for manual matching. Based on the enhancement fingerprint method used, most of the latent fingerprint was developed with various qualities. Based on the percent recovery, SPR method shows the best recovery (43.75 %) at the scale 3 fingerprint, followed by superglue fuming and dusting powder. In manual matching method, percentage success rate in the case where fire of Molotov cocktails was allowed to burn out naturally was 55.56 % while in the case of fire extinguished using water, percentage success rate was 33.33 %. This study also showed that manual matching method of fingerprints recovered from Molotov cocktails with fingerprint obtained from suspect or standard can be done.

ABSTRAK

Peningkatan laporan mengenai kes-kes *Molotov cocktail* di media tempatan telah menjamin keperluan untuk siasatan terperinci pelaku jenayah. Oleh itu, satu kajian dilakukan untuk membandingkan kualiti cap jari yang didapati daripada serpihan kaca *Molotov cocktail*. Bahan bakar yang digunakan adalah petrol, minyak tanah, diesel dan minyak motor. Jenis bahan bakar yang berbeza digunakan untuk memerhatikan kesan bahan bakar pada kualiti cap jari yang pulih daripada serpihan kaca *Molotov cocktail*. Dalam kajian itu, *Molotov cocktail* diletupkan dan serpihan kaca yang mengandungi tanda-tanda cap jari dikumpulkan dan diangkut kembali ke makmal untuk analisis. Sebelum analisis cap jari, jelaga dikeluarkan dari serpihan kaca menggunakan tiga kaedah iaitu memberus, larutan natrium hidroksida (NaOH) 2 % dan dengan menggunakan pita selofon. Selepas penyingkiran jelaga, penimbulan cap jari dilakukan dengan menggunakan kaedah yang berbeza seperti kaedah serbuk cap jari, kaedah *superglue fuming* dan kaedah *Small Particle Reagent* (SPR). Kemudian, cap jari dari serpihan kaca *Molotov cocktail* dikenal pasti dengan pemadanan secara manual. Kaedah serbuk cap jari telah digunakan bagi sampel petrol sahaja kerana kebanyakan serpihan kaca telah diperolehi dalam keadaan kering. Selain daripada itu, kaedah *superglue fuming* telah digunakan dalam majoriti sampel sama ada *Molotov cocktail* dibenarkan untuk membakar secara semula jadi atau kebakaran dipadamkan dengan menggunakan air. Kaedah *small particle reagent* kebanyakannya digunakan untuk serpihan kaca basah. Gambar cap jari yang diperoleh dihantar kepada pemadanan manual. Berdasarkan kaedah peningkatan cap jari yang digunakan, kebanyakan cap jari pendam telah dibangunkan dengan pelbagai kualiti. Berdasarkan peratus pemulihan, kaedah SPR menunjukkan pemulihan terbaik (43.75 %) pada cap jari skala 3, diikuti oleh *superglue fuming* dan serbuk cap jari. Dalam kaedah pemadanan manual, peratusan kadar kejayaan dalam kes di mana api *Molotov cocktail* dibenarkan untuk membakar keluar secara semula jadi adalah 55.56 % manakala dalam kes api *Molotov cocktail* dipadamkan menggunakan air, peratusan kadar kejayaan adalah 33.33 %. Berdasarkan hasil kajian ini, padanan cap jari yang diperolehi daripada *Molotov cocktail* dengan cap jari yang diperolehi daripada suspek atau standard yang boleh dilakukan.