

## The collection and identification of gunshot residues to distinguishing 4 types of bullets by inductively coupled plasma mass spectrometry

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The identification of gunshot residue (GSR) dispersed in a shooting is important for forensic evidence to solve the firearm shooting crimes. In this experimental study, the residue of specific elements, namely: Lead (Pb), Antimony (Sb) and Barium (Ba) were compared using inductively coupled plasma mass spectroscopy from 4 types of 9 mm. ammunition labeled as A is Lead Round Nose (LRN) 135 gr., B is Jacketed Hollow Point (JHP) 115 gr., C is Full Metal Jacketed (FMJ) 124 gr. all of Bullet Master and D is Full Metal Jacketed (FMJ) of Thai Arms. The Bullet holes from wooden and metal targets at 7 firing ranges; 0.00, 0.15, 1.00, 1.50, 2.00 and 2.50 meters were investigated by cotton swab dripped with 5% nitric acid. The analytical results showed that at the firing range of 0.00 meters, very high concentrations of Pb was found more than Sb and Ba, while the outer side of the hole found more amount of the elements than the inner side. Moreover, the results shown the amount of Pb, Sb, and Ba of ammunition A (LRN), B (FMJ) and C (JHP) of Bullet Master are significant difference, and classify the ammunition C (FMJ) of Bullet Master from the ammunition D (FMJ) of Thai Arms using Pb and Sb concentration. From the results of this study can be useful scientific evidence for forensic science investigation in order to estimate the ammunition and firing distances.

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