

Electronic supplementary information

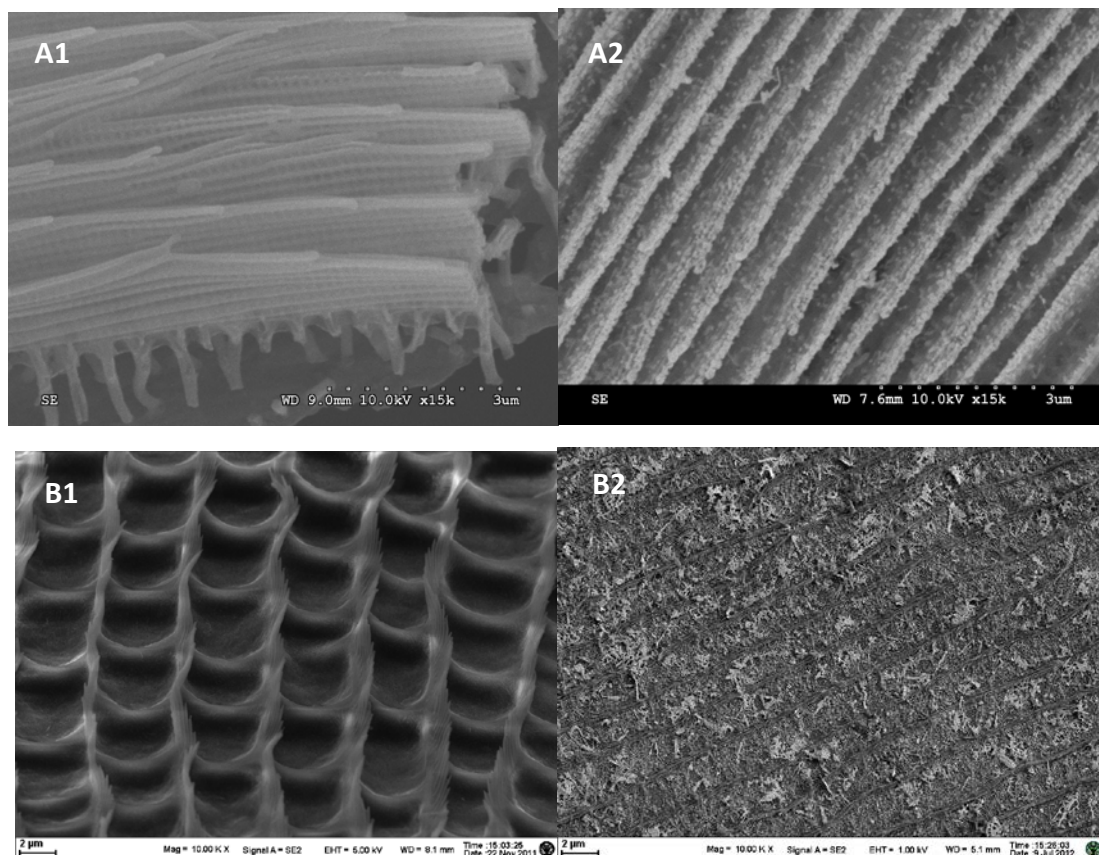
***In Situ* Synthesis of Gold Nanoparticles (AuNPs) in Butterfly Wings for Surface Enhanced Raman Spectroscopy (SERS)**

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Table S1 Speci-belongings of the three butterflies in this study

Kingdom	<i>Animalia</i>		
Phylum	<i>Arthropoda</i>		
Class	<i>Insecta</i>		
Order	<i>Lepidoptera</i>		
Family	<i>Nymphalidae</i>	<i>Papilionidae</i>	
Genus	<i>Morpho</i>	<i>Papilio</i>	<i>Ornithoptera</i>
Species	<i>Morpho menelaus</i>	<i>Papilio ulysses telegonus</i>	<i>Ornithoptera croesus lydius</i>



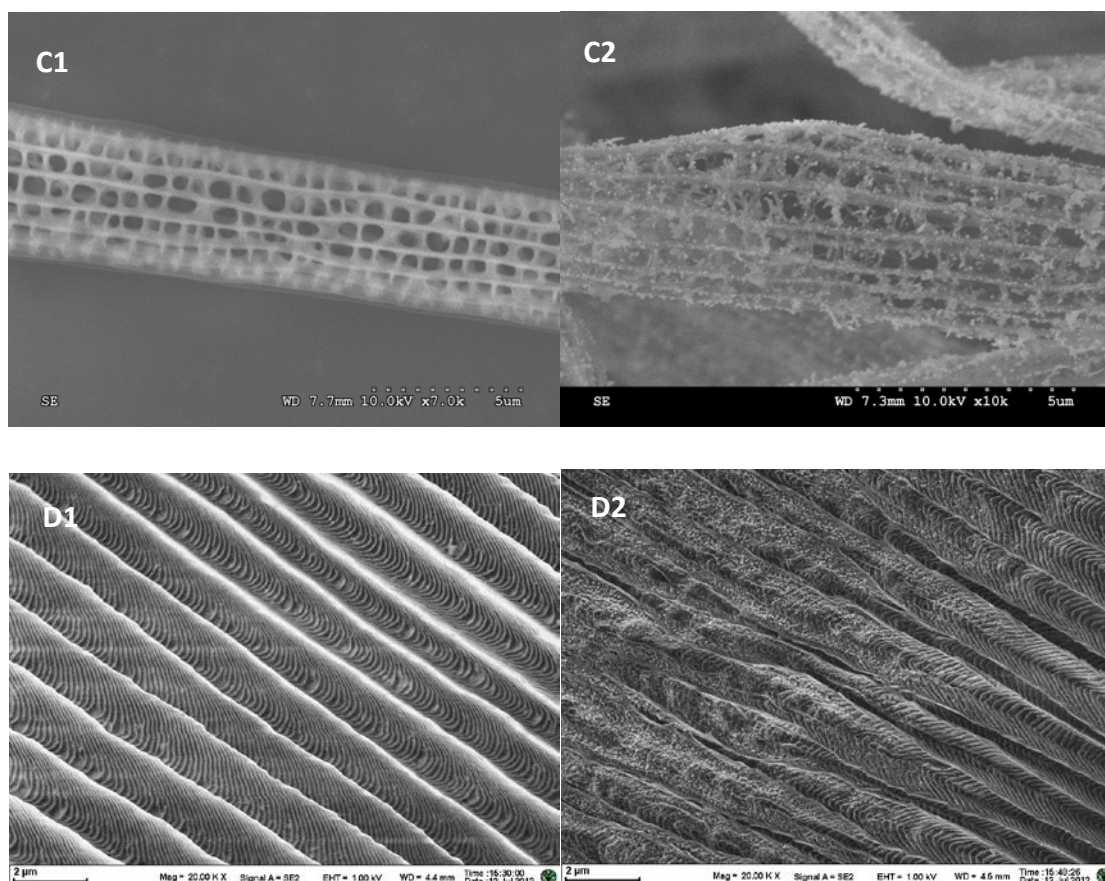


Figure S1. SEM images of (A) *M. menelaus*, (B) blue region and (C) fiber region of *P. u. telegonus*, (D) *O. c. lydius*, (1) before and (2) after the whole treatment.

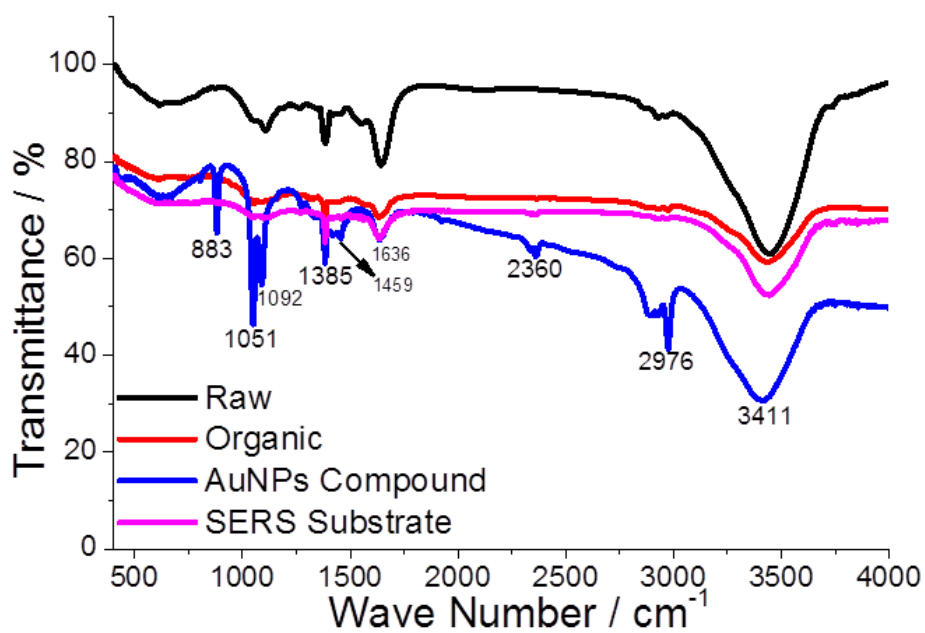


Figure S2. FTIR spectra of the *Morpho menelaus* wing at each stage
From organic component of *M. menelaus* to AuNPs organic compound, 1458cm^{-1} peak emerged

and 1642cm^{-1} shifted to 1636cm^{-1} . The emerging and shifting also confirms that the amine of the organic component is coordinated to gold nanoparticle¹ for the stabilization of the gold nanoparticle.(Ref. 35, 36 in the manuscript)