

Figure S1: (A) UV-visible Spectrophotometer absorption range at 670 nm; (B) FT-IR analysis shows a several functional groups from green cluster copper nano-pesticide synthesized from *M. robertsii*

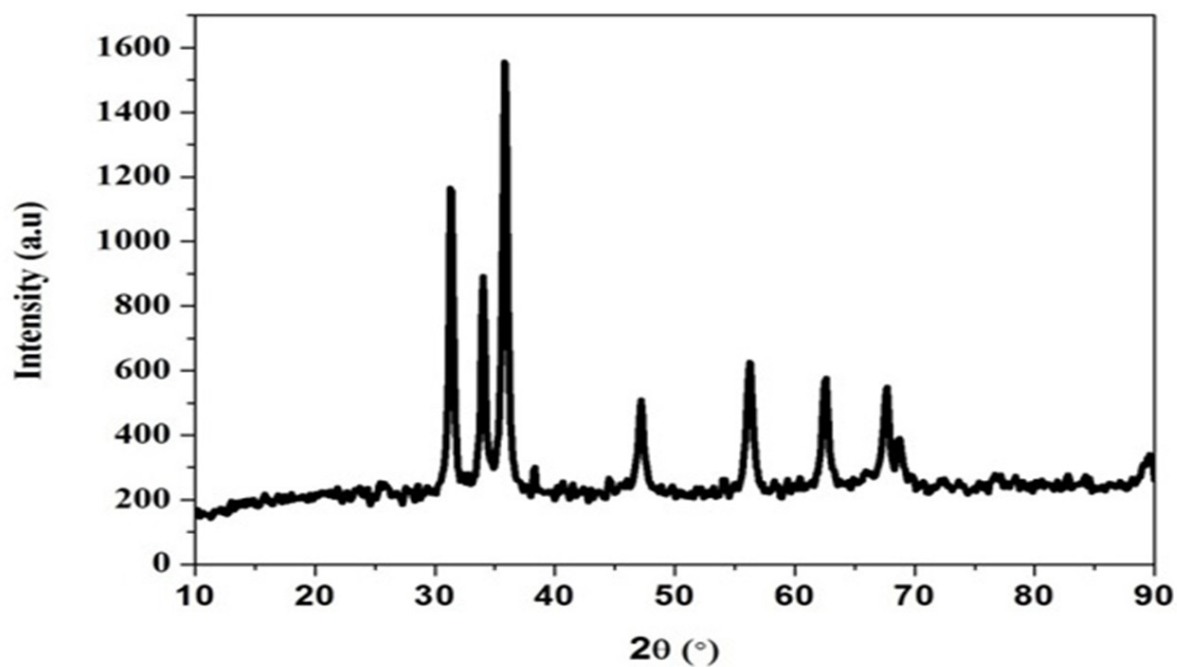


Figure S2: XRD shows 3 strongest peak values at 29.4389, 35.1523 and 36.8562 this strongest peak value tells about the crystalline structure of copper nano-particles

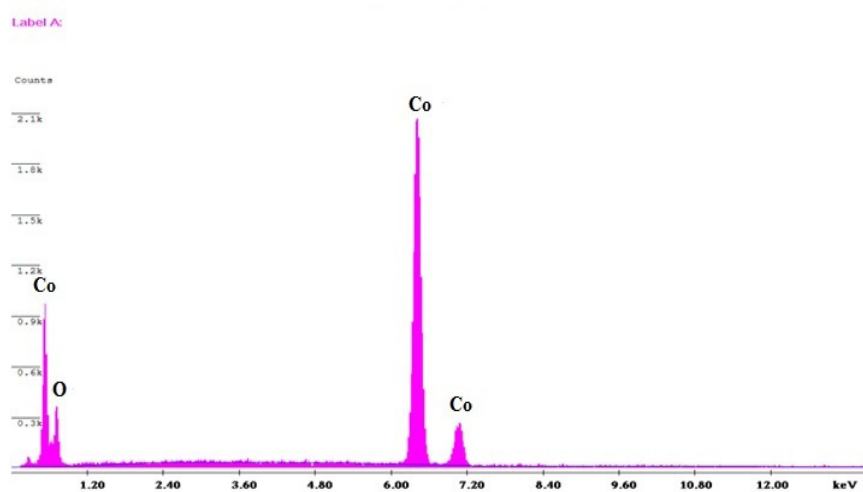


Figure S3. EDaX image gave an exact elementary composition and the ranges from 0 to 20 keV. It shows some elements such as O and CU.

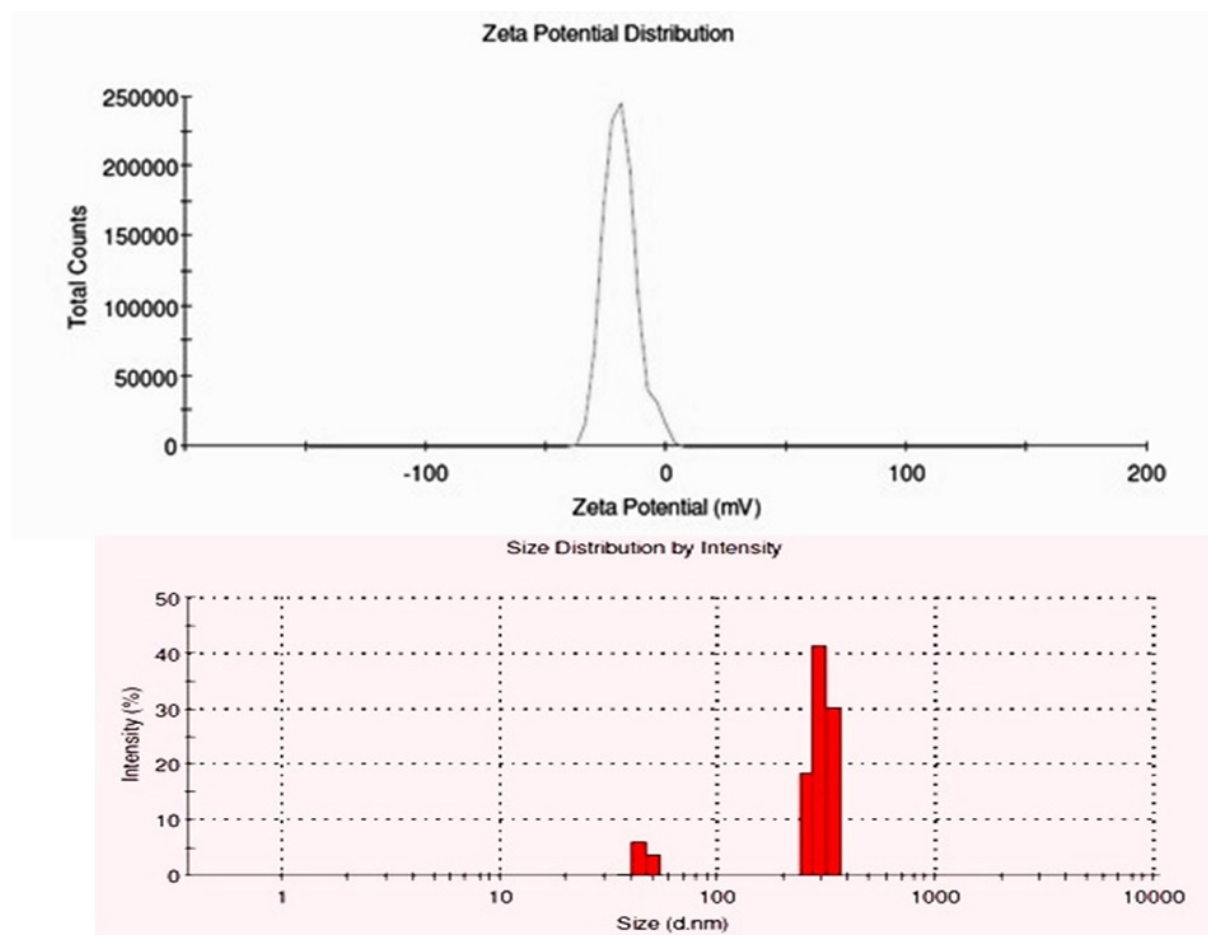


Figure S6: Zeta potential and DLS of green synthesized copper nanoparticles

Table S1: FT-IR functional group's identification of green cluster copper nano-pesticide synthesized from entomopathogenic fungi *M. robertsii*

S.no	Vibrational assignment	Observed wavenumber (cm ⁻¹)	Functional group	Visible intensity
1	ArO-H H bonded	3441.90	Phenols	Broad peak
2	-CH ₂ -	2831.11	Alkanes	Medium small sharp peak
3	Ar-CH=CHR	2400.61	Alkenes	Medium peak
4	C-O stretching	1600.18	Carboxylic acids	Small broad peak
5	C-H out of plane	1000.61	Aromatics	Medium peak
6	=CH out of plane	820.15	Alkenes	Medium peak
7	S-S disulfide asym	500.18	Misc	Medium sharp peak