**Highlights:**

# Facile, ecofriendly green synthesis of ZnO by *Stevia rebaudiana* is highlighted.

# SR-ZnO were characterized by UV-spectrophotometer, FE-TEM, XRD and DLS.

# Flower-shaped SR-ZnO of 500-1000 nm with a PDI of 0.33 ± 0.002.

* Metabolites inleaf extract were likely to provide stabilization against aggregation.

# 76% methylene blue was photodegraded within 30 min by SR-ZnO and plant extract.