**Abstract**

Objective To develop a novel approach for the green synthesis of silver nanoparticles using aqueous leaves extracts of Catharanthus roseus (C. roseus) Linn. G. Don which has been proven active against malaria parasite Plasmodium falciparum (P. falciparum). Methods Characterizations were determined by using ultraviolet-visible (UV-Vis) spectrophotometry, scanning electron microscopy (SEM), energy dispersive X-ray and X-ray diffraction. Results SEM showed the formation of silver nanoparticles with an average size of 35–55 nm. X-ray diffraction analysis showed that the particles were crystalline in nature with face centred cubic structure of the bulk silver with the broad peaks at 32.4, 46.4 and 28.0. Conclusions It can be concluded that the leaves of C. roseus can be good source for synthesis of silver nanoparticle which shows antiplasmodial activity against P. falciparum. The important outcome of the study will be the development of value added products from medicinal plants C. roseus for biomedical and nanotechnology based industries.