RESULTS AND DISCUSSION

In the present study, FTIR spectra were useful to identify the potential bioactives in the extract responsible for capping biosynthesized AuNPs. FTIR spectrum is used to probe the chemical constitution on the surface of AuNPs [4]. In Fig. 2, FTIR spectrum of phytosynthesized AuNPs showed the two strong IR bands of hydroxyl and phenols (3447.69 cm-1), whereas C=C stretch of benzene and amide-I linkage (1638.26cm-1) and other IR bands of (2075.70 cm-1) and (555.62 cm-1). Absorption peak (1638.26 cm-1) in the infrared region of the electromagnetic spectrum exhibits the binding of amide linkage with AuNPs which may be assigned to the carbonyl stretch in proteins and clearly indicates the presence of protein as capping agent for AuNPs. Proteins have stronger affinity to bind AuNPs which increases the stability of synthesized nanoparticles [5]. These results confirmed that carbonyl group of amino acid residues has strong binding ability with metal leading to the formation of layer adsorbed on the surface metal nanoparticles as capping agent to prevent agglomeration [5].

Phytosynthesized AuNPs as polycrystalline structure were revealed as shown in Fig.3. Structural analysis by SEM showed 10 µm in size of AuNPs.

Fourier Transform Infra Red spectroscopy (FTIR)

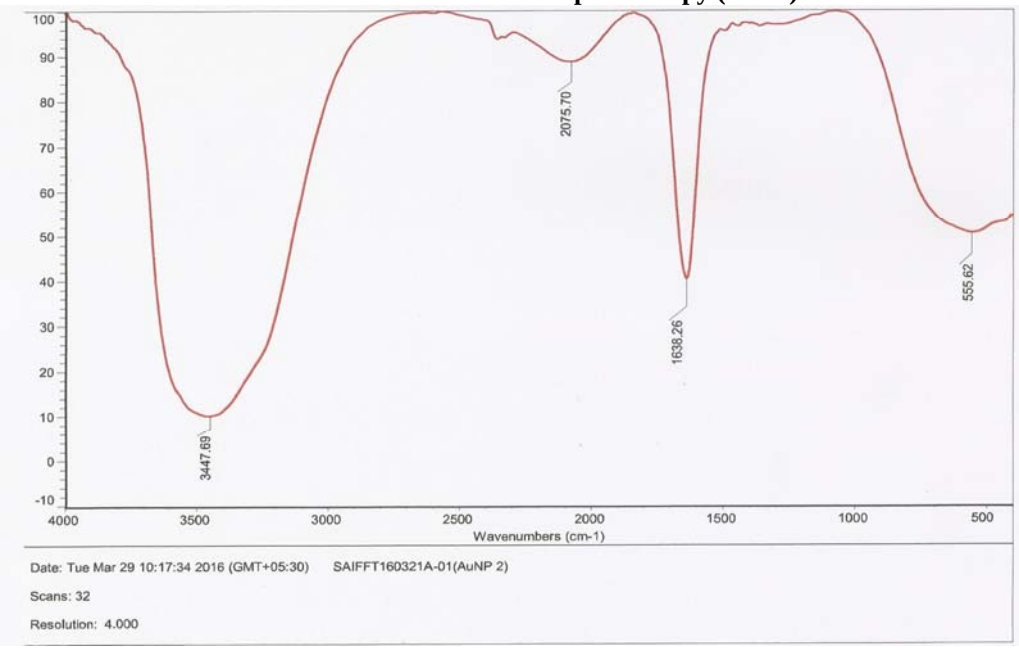

Fig. 2: FTIR image of gold nanoparticles

Scanning Electron Microscopy

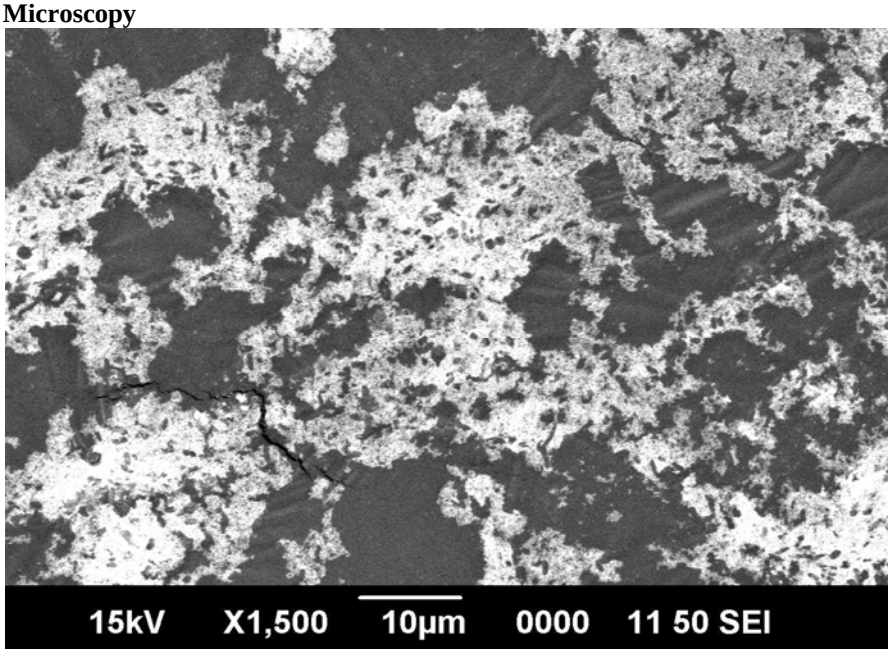

Fig. 3: SEM image of gold nanoparticles

Transmission Electron Microscopy

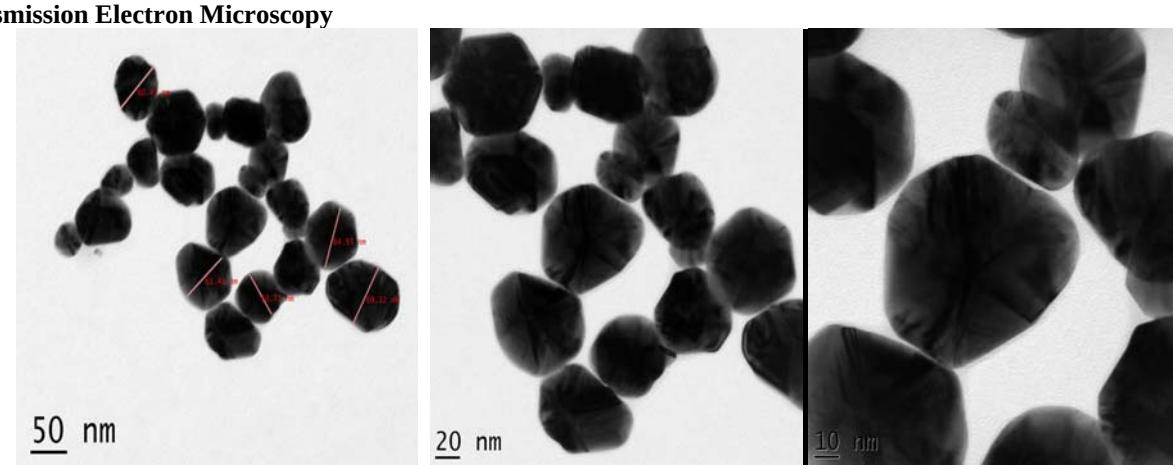

Fig. 4: TEM image of gold nanoparticles in different dimensions (50nm, 20nm, 10nm)

Morphology of AuNPs was investigated by TEM in fig. 3. TEM images have shown AuNPs 50 nm, 20 nm and 10 nm in average diameter and spherical cube shape.

In our previous studies, we have used sunlight irradiation to induce green synthesis of silver nanoparticles by using *Kalanchoe pinnata* extract [6] and found synergistic activity [7] when it was conjugated with antibiotic ciprofloxacin against bacterial strains. In future, it will be carried out the antibacterial activity of AuNPs conjugated with antibiotic in the bacterial culture.

CONCLUSION

From remarkable results in the present study, it is concluded that gold nanoparticles can photosynthesized by flower petals extract as an alternative to physical and chemical synthesis. Sunlight irradiation is useful as catalyst to accelerate the process of biosynthesis of nanoparticles.

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CONFLICT OF INTEREST STATEMENT

Authors declare that there is no conflict of interest.

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