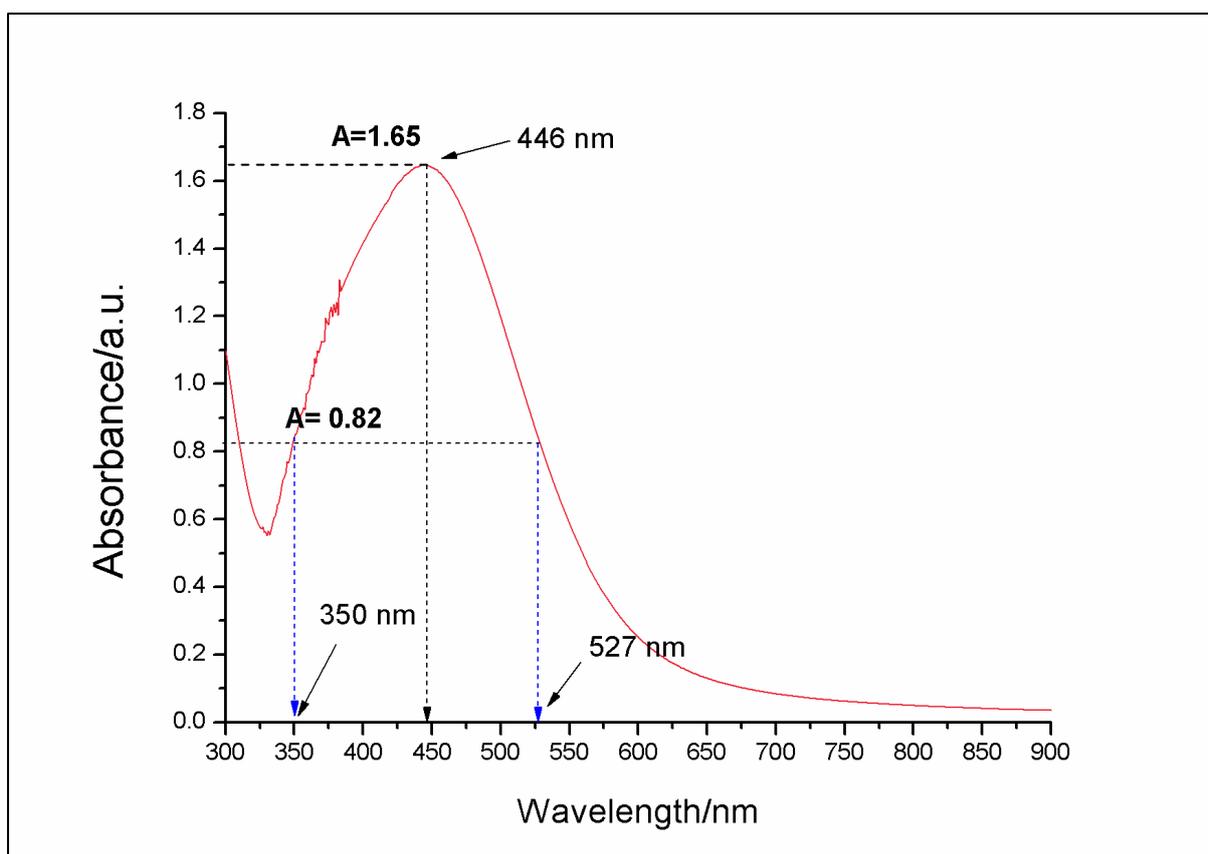


Rapid biosynthesis of silver nanoparticles by exploiting the reducing potential of *Trapa bispinosa* peel extract

### Scheme S1 Calculation of Full width half Maxima (FWHM)

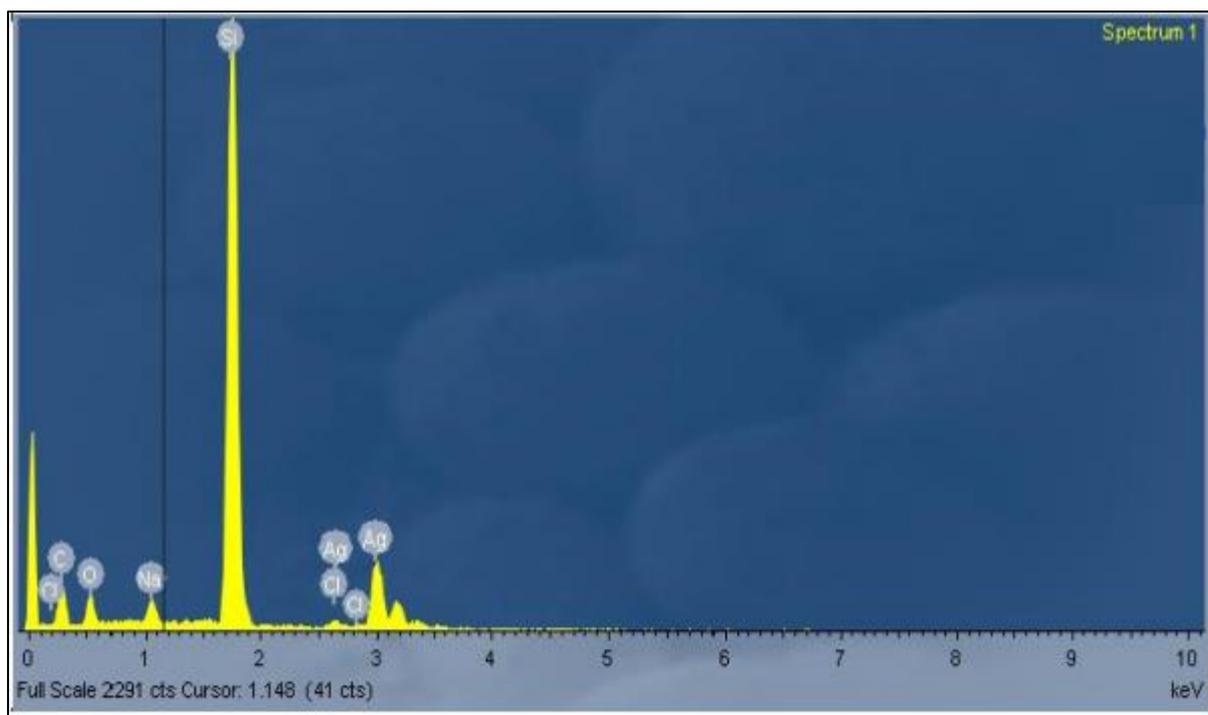


**Fig. S1 Representative calculation of FWHM of 40 min old ripened sample of SNPs. As shown in the figure, the maximum absorbance (A) obtained at  $\lambda_{\max}$ = 446 nm was 1.65 and at half maximum absorbance at the same wavelength (A at  $\lambda_{\max}/2$ ) was 0.82. So the spectral width range of wavelength extending at 0.82 were as shown in the figure with blue arrows as 350 nm to 527 nm. That means, at half maximum absorbance the full width value would be the difference between 527 and 350 nm i.e. 177 nm. Hence, the calculated FWHM is 177 nm. In a similar way, all the values of FWHM were calculated**

using OriginPro 8 Windows platform for Fig.1 in the manuscript. For all the values refer Table S1.

**Table S1 Values used for calculating FWHM for Fig.1.**

Sr.No.	Time (min)	A at $\lambda_{\max}$	A at $\lambda_{\max 1/2}$	Width range	FWHM (nm)
1.	5	0.78	0.39	341-514	173
2.	10	1.05	0.53	347-517	170
3.	15	1.26	0.63	347-520	173
4.	20	1.38	0.67	347-525	178
5.	25	1.47	0.73	351-523	172
6.	30	1.54	0.77	347-526	179
7.	35	1.61	0.80	349-526	177
8.	40	1.65	0.82	350-527	177



**Fig.S2 EDAX of SNPs synthesized using *Trapa bispinosa* peel extract. The appearance of other impurities like carbon and oxygen may be due to other compounds in the plant extract. The peak for silicon is due to the substrate used for coating nanoparticle solution before analysis.**

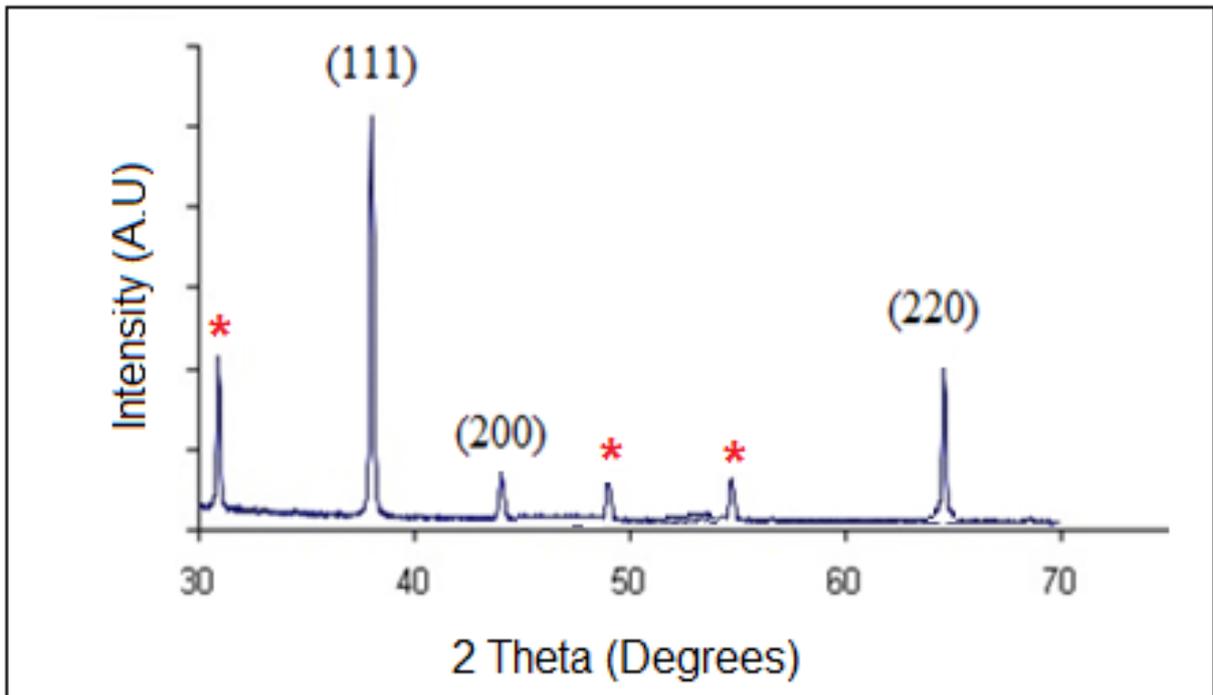


Fig.S3 X- Ray diffraction graph of SNPs synthesized using *T. bispinosa* peel extract. Four distinct Bragg's diffraction peaks at 38.40°, 44.32° and 65.11°. There are certain unassigned peaks (designated by \*) at diffraction peaks 32.25°, 48.3° and 56.13° may be assigned to amorphous and organic phases of SNPs.

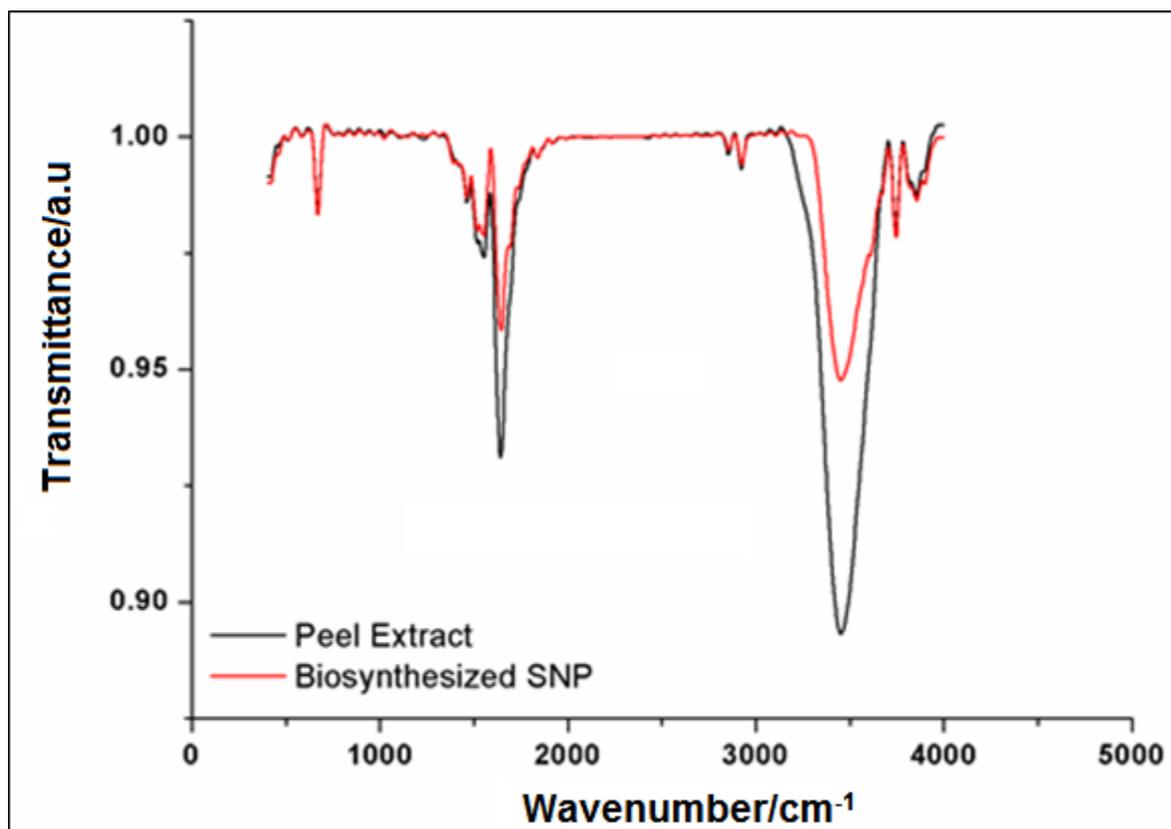
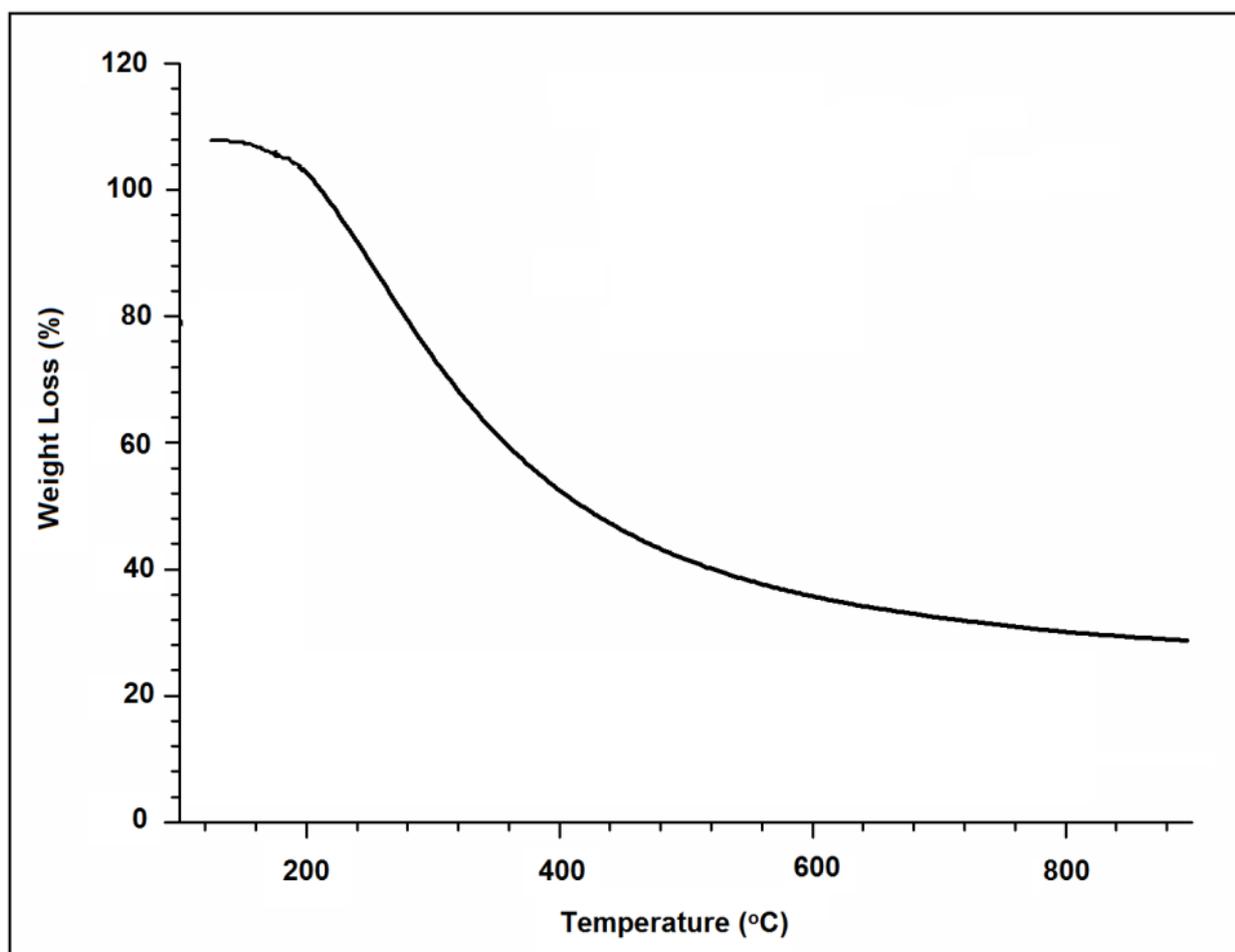


Fig S4 FTIR spectra showing the capping property on SNPs synthesized using *T. bispinosa* peel extract. Comparative FTIR spectra of peel extract and SNPs synthesised using the same shows involvement of capping proteins. Absorbance bands originated at 1548, 1637.47, 3452.39 and 3865.14  $\text{cm}^{-1}$  in peel extract are assigned to  $-\text{CH}_2$  or  $\text{C}=\text{C}$  stretching of alkanes,  $\text{C}=\text{C}$  stretching of aromatic compounds (may be associated with the amino acids such as tyrosine),  $-\text{OH}$  stretching of alcohols or  $-\text{NH}_2$  and  $-\text{NH}$  stretching of primary amines respectively. Strongest absorbance is exhibited by the peak appearing at 3865  $\text{cm}^{-1}$  corresponding to primary amines which are widely found in proteins and amino acids. When these spectra are compared with those obtained after the synthesis of SNPs, there was shift in few initial peaks as well as appearance of new peaks was clearly evident. There was shift in peaks from 1548 to 1564.18  $\text{cm}^{-1}$ , 1637.47 to 1643.26  $\text{cm}^{-1}$ , 3452.39 to 3458.18  $\text{cm}^{-1}$  and a negligible shift in case of peak at 3865  $\text{cm}^{-1}$  when compared with the bands observed in case of peel extract. Moreover, there was intense increase in the absorbance of the peak at 3865  $\text{cm}^{-1}$  indicating the dominant role of primary amines as interacting agents in order to stabilise the SNPs in the solution. However, other types of non-covalent interactions cannot be ruled out.



**Fig S5 Thermo Gravimetric Analysis of SNPs synthesized using *T. bispinosa* peel extract in the form of dried powder. TGA measures the value and rate of weight loss with respect to temperature under controlled environment. Weight loss at different temperatures indicates the composition as well as thermal stability of the complex. In our case, a prominent loss at 140°C indicates the presence of weaker interactions such as water molecules associated with the surface of nanoparticles. Further weight loss shows the involvement of capping proteins along with reducing agents associated with peel extract.**