International Journal of Botany Studies
www.botanyjournals.com
ISSN: 2455-541X
Received: 29-12-2021, Accepted: 13-01-2022, Published: 29-01-2022
Volume 7, Issue 1, 2022, Page No. 579-586

Antioxident, Anticancer activity and phytochemical analysis of *Tabebuia rosea*

K Devika, G Anburaj, R Manikandan
Department of Chemistry, Avvm Sri Pushpam College, (Affiliated to Bharathidasan University-Tiruchirappalli) Thanjavur, Tamil Nadu, India

Abstract
Human have been persistently using plants and plant things to overcome various diseases. The cell support property of the plant sources is concentrated to obtain a solid drug against harm. The objectives of the momentum examination is to evaluate the cell support and cytotoxic activity of the *Tabebuia rosea* isolates against cell breakdown in the lungs cell line in relationship with vincristine drug. The cell support activity was thought about using the standard DPPH measure Hydrogen Peroxide and Diminishing power development and cytotoxic activity using MTT test. DPPH test Hydrogen Peroxide test and decreasing power test measure results show that methanolic concentrate of *Tabebuia rosea* in higher center show ideal malignant growth anticipation specialist potential over the standard L-ascorbic acid. Cytotoxic activity was analyzed using MTT test which demonstrated that the development in gathering of concentrate assembles the cell death. At 100µg/mL obsession there is an extended cytotoxic activity, i.e., almost 100% of cell block. The results of malignant growth avoidance specialist and anticancerous development may be positively related.

Keywords: *Tabebuia rosea* extract Antioxidant assay and cytotoxicity

Introduction
Cancer forestallment agent movement of methanol concentrate of *Tabebuia rosea* Free fanatics are subject for causing endless conditions including peril, cardiovascular disease, neural issues, Alzheimer's affliction, delicate internal failing, Parkinson's sickness, alcohol provoked liver illness, ulcerative colitis, developing and atherosclerosis. [1-2]. Protestation against free revolutionaries can be bettered by acceptable evidence of salutary malice avoidance drivers. Significant verification shows that pabulum containing cell bastions and perhaps plicitly the malice avoidance specialist advancements may be introductory in free revolutionary intermediated conditions [3].
The mortal body has an erratic plan of trademark enzymatic and nonenzymatic malice expectation specialist assurances which kill the dangerous goods of free revolutionaries and colorful oxidants [4]. Cell bastions may be of unknown bit of latitude in perfecting the individual fulfillment by hindering or postponing the launch of degenerative affections. Likewise, they've a eventuality for liberal hold means in the cost of clinical administrations transport. Colorful systems are used to probe the cell support property of tests (eats less, factory removes, business malice expectation drivers, etc.). [5]

Material and Method
1. Collection of plant material
The fresh plant of *Tabebuia rosea* was collected from Kumbokonam, Thanjavur district of Tamil Nadu, India.The collected plants were further surface sterilized using tween 80 and it was shade dried for future investigation.

2. Preparation of plant extract
10 g of both fresh and dried bark, flowers were chopped into fine pieces and macerated in 100 mL of methanol. The plant material was extracted at room temperature for 3 days in a shaker. The extract was filtered and the filtrate was concentrated in a rotary evaporator under reduced pressure to dryness. The extract obtained was stored at 4 oC until use.

3. Determination of in-vitro antioxidant activity
Assay of DPPH radical-scavenging activity followed by the method of Shimada, *et al*., 1992. [6] Determination of Hydrogen peroxide scavenging activity of the extract was estimated by method of Zhang (2000) [7]. The reducing power activity was examined by Oyaizu (1986) method. [8]

Results and Discussion

1. DPPH progressive looking through activity

1, 1-Diphenyl-2-picrylhydrazyl moderate is an all things considered utilized framework to survey the free enthusiast rummaging cutoff of different concentrations and mixes. DPPH is a nitrogen focused aficionado and the developments of covering from violet to yellow upon decay is seen by the example of hydrogen or electron favoring. In the event that test concentrate could play out this response cell stronghold potential can be surveyed of a relative free moderate rummaging movement of the test separate is evaluated. It was seen that the free extreme glancing through exercises of *Tabebuia rosea* regular things reached out with developing center interest. The cell support substance present in the concentrate counters with DPPH free silly arrangement and changes over them into its diminished design either by moving electron or giving hydrogen molecule followed by proton [9].

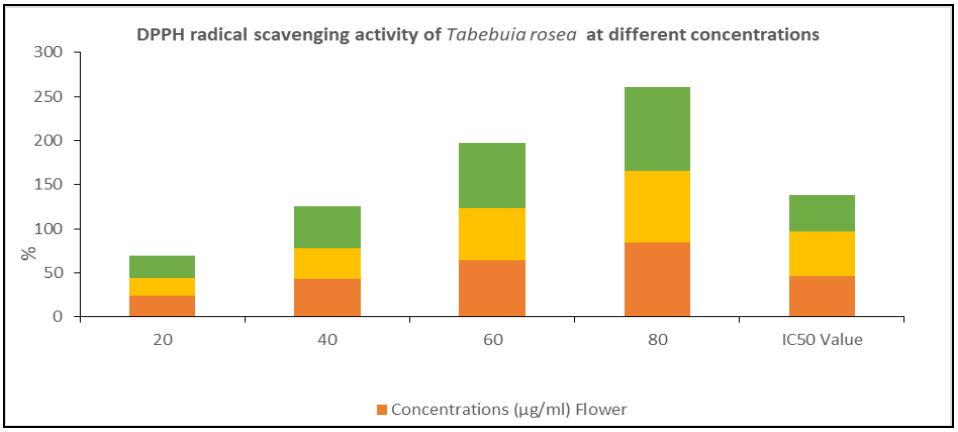

Fig 1: DPPH revolutionary searching action of T*abebuia rosea* natural items at different obsessions DPPH moderate rummaging movement of ordinary things concentrate and standard ascorbic dangerous are endeavored.

The half hindrance place (IC50) of *Tabebuia rosea* regular things eliminate and ascorbic damaging were 46.29µg/ml, 51.12µg/ml and 41.05µg/ml autonomously. The unripe standard things separate showed a tremendous fragment subordinate obstruction of DPPH advancement. The capacity of L-ascorbic damaging to glance through DPPH moderate is unmistakably near with the fixations. The DPPH measure improvement of *Tabebuia rosea* unripe normal thing kill is close to standard as ascorbic damaging (Table 1 and fig 1).

2. Hydrogen peroxide rummaging movement of *Tabebuia rosea* at various fixations

Hydrogen peroxide is quite possibly the most colossal responsive oxygen specie bound from superoxide. It very well may be changed to the hydroxyl moderate through the Fenton response where progress metals particles, (for example, Fe2+) diminish hydrogen peroxide to the hydroxyl revolutionary in this manner the chelation of Fe2+ particles similarly as the decrease of Fe3+ particles is a critical occasion in the balance or reduction of oxidative weight. The hydroxyl moderate responds strangely with any full scale atom it contacts, in this way initiating cell stress. Hydrogen peroxide besides harms cells through direct oxidation of lipid, proteins,DNA, and in this way necrotic cell passing by techniques for mitochondrial-driven apoptosis (10-11). Thusly the looking of hydrogen peroxide could decrease these cell impacts and contribute all around to the improvement of success and flourishing. The hydrogen peroxide glancing through action of Evolvulus alsinoides reached out with developing center interests. further more ascorbic damaging were 47.31, 51.43µg/ml and 42.74µg/ml autonomously. (fig 2).

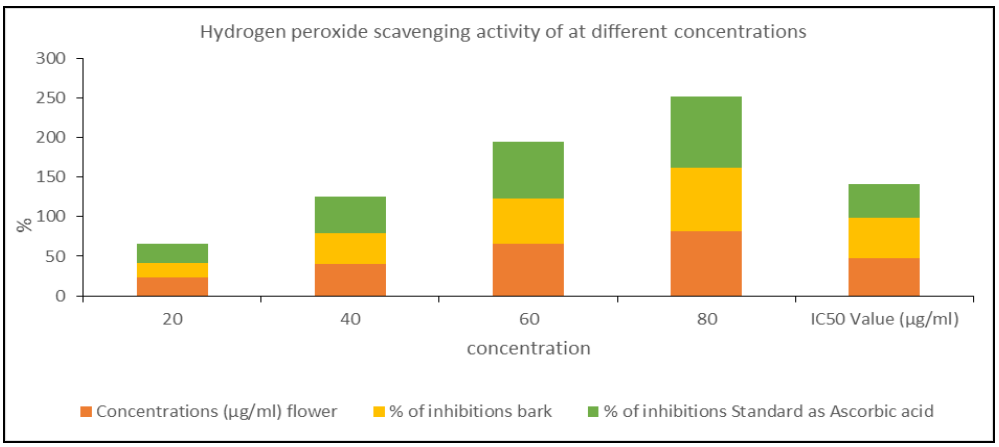

Fig 2: Hydrogen peroxide scavenging activity of *Tabebuia rosea* at different concentrations

Fig.2 portrays the Hydrogen peroxide searching impact of *Tabebuia rosea* normal things eliminate. The hydrogen peroxide glancing through movement of Tabebuia rosea normal things separate stretched out with developing focuses in Table 4.6. The half square fixation (IC50) of *Tabebuia rosea* trademark things eliminate and ascorbic dangerous were 47.31, 51.43µg/ml and 42.74µg/ml freely. (Table 2 and fig 2).

3. Reducing force development

For assessing the decreasing limit, the Fe3+ - Fe2+ change was investigated inside seeing *Tabebuia rosea* common items isolates. The reducing furthest reaches of a compound may fill in as an important marker of its potential cell fortification activity. Regardless, the development of cell fortifications has been named to various frameworks, for instance, evasion of chain beginning, legitimate of progress metal molecule driving forces, crumbling of peroxides, contravention of continued with hydrogen reflection, reductive cutoff and progressive looking through activity [12-13]. The decreasing force of *Tabebuia rosea* regular items removes extended with growing estimation. All the measurements exhibited on a very basic level higher activities than the control showed more vital diminishing power, indicating that cell fortification development *Tabebuia rosea* organic products extricate (fig 3).

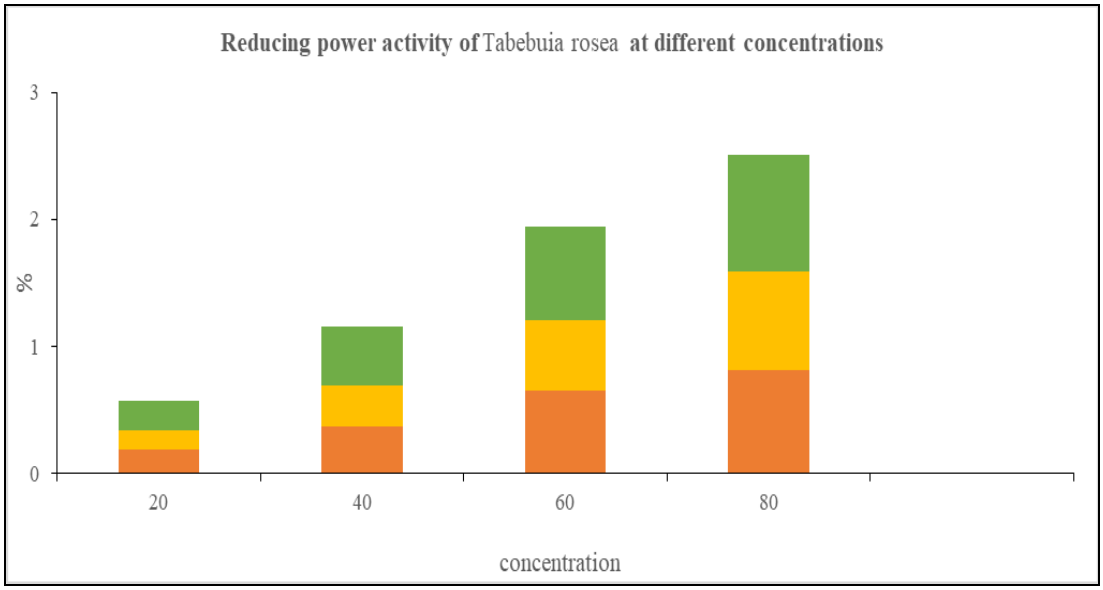

Fig 3: Reducing power activity of *Tabebuia rosea* at different concentrations

Figure 3: Diminishing force development of *Tabebuia rosea* regular items at different core interests

The flow evaluation has exhibited that the methanol concentrate of *Tabebuia rosea* normal things contains gigantic extent of phenolics and hence, can be inferred that these phenolics are answerable for their recognizable cell support improvement as attempted through different *in vitro* models utilized in the assessment. Among the two plants, Tabebuia rosea take out has likely trademark exercises than *Tabebuia rosea* normal thing eliminate was seen. This is the concurrence with two or three reports that have shown agreeable relationship between incomparable phenolic substance and antioxidative turn of events [14-18]. Methanolic concentrate of *Tabebuia rosea* regular things have basic cell support properties and the use of this under-misused plant might acknowledge a limit in frustrating human illnesses where free reformists are joined, for example, cardiovascular burden, hurt and abnormal creating. ascorbic damaging were 0.92 ± 0.06, 0.81 ± 0.05 µg/ml and 0.78 ± 0.05/ml autonomously. (Table 3 and fig 3). *In vitro* anticancer activity of methanol concentrates of blossom of *Tabebuia rosea* HepG2 cell lines:

Human hepatoma cell lines have been proposed as a choice rather than human hepatocytes for *in vitro* models of ordinary liver cells [19]. Liver culture models for hepatotoxicity ponders that impersonate *in vivo* hepatic convenience could assist with fortifying further developed frameworks for early peril evaluation during drug development [20] HepG2 is a ceaseless cell line including human liver carcinoma cells, gotten from the liver tissue of a 15-year-old Caucasian male who had a particularly detached hepatocellular carcinoma. Hepatocellular carcinoma is, all over, the fifth most-standard underhandedness [21]. Compound started destructiveness in HepG2 cells watches out for a sensible *in vitro* model for hepato toxicological assessment of arrangements, through evaluation of different cytotoxic endpoints [22]. Beginning late, much idea has been spun around taking a gander at the hepatotoxicity furthest extents of routinely happening mixes and their instruments of progression. In this, we have outlined the anticancer advancement of *Tabebuia rosea* kill on the assessment of cytotoxicity to HepG2 cells.HepG2 Cell lines are sensible for in-vitro model structure. the HepG2 Cell line with sensible culture conditions shows sound morphological.

In the stream assessment, in-vitro cytotoxicity effects of blossom of *Tabebuia rosea* was finished with various obsessions for the subverting progression cell lines Hep G2 (human liver sickness cell line). Five explicit spots (100 µg/ml, 200 µg/ml, 300 µg/ml, 400 µg/ml and 500 µg/ml) of plant clears out were used to consider the

cytotoxicity furthest reaches of the plant. The cytotoxicity limit of various groupings of methanolic concentrates of Tabebuia rosea was displayed in Table 4.9 and fig 4.29. The results revealed that the cytotoxicity rate was expanded when the groupings of plant separate augmentations. MTT survey assessed the cell reasonableness subject to the abatement of yellow tetrazolium MTT to a purple formazan hiding mitochondrial dehydrogenase substance. Thusly, the degree of formazan made reflected the proportion of metabolically astonishing sensible cells. Among the two plants disposes of, the methanolic concentrate of fledgling of *Tabebuia rosea* blossom have the basically solid cytotoxicity improvement 86.36±2.62 followed by *Tabebuia rosea* bloom of 81.82±2.62 at a centralization of 500 µg/ml openly.Layer validity can be assessed by surveying LDH advancement. LDH, a creation organized in the cytoplasm, catalyzes the distinction in lactate and pyruvate. At the point when LDH is found inside the media on the cells, there are two probably causes: the first is cell passing and the second might be a 'spill' in a cell film. Right when cells are disturbed, LDH advancement is raised. Results got in the present *in vitro* evaluation show no massive changes of LDH levels in the way of life medium were seen after 24 h of preamble to eliminates from *Tabebuia rosea* bark and flower (Table2). *Tabebuia rosea* flower eliminate all around broadened the extracellular LDH levels (83.25±0.23) at fixations 500 µg ml−1 as separated and the methanolic concentrate of *Tabebuia rosea* flower (81.01±0.29). Cell good judgment was fundamentally diminished (5.56±0.73) with developing centralizations of bark eliminate, the positive control. Fixations higher than 200 µg ml−1 from an overall perspective expanded the extracellular LDH levels coming to about 100% at the most significant focus endeavored. In trypan blue forbiddance strategy (Fig 4.29 and 4.32), at fixation 500 µg/ml of *Tabebuia rosea* flower a demonstrated more essential impact against non-reasonable cell lines 94.44±0.73), however for *Tabebuia rosea* exhibited less important effects (84.88±1.50).

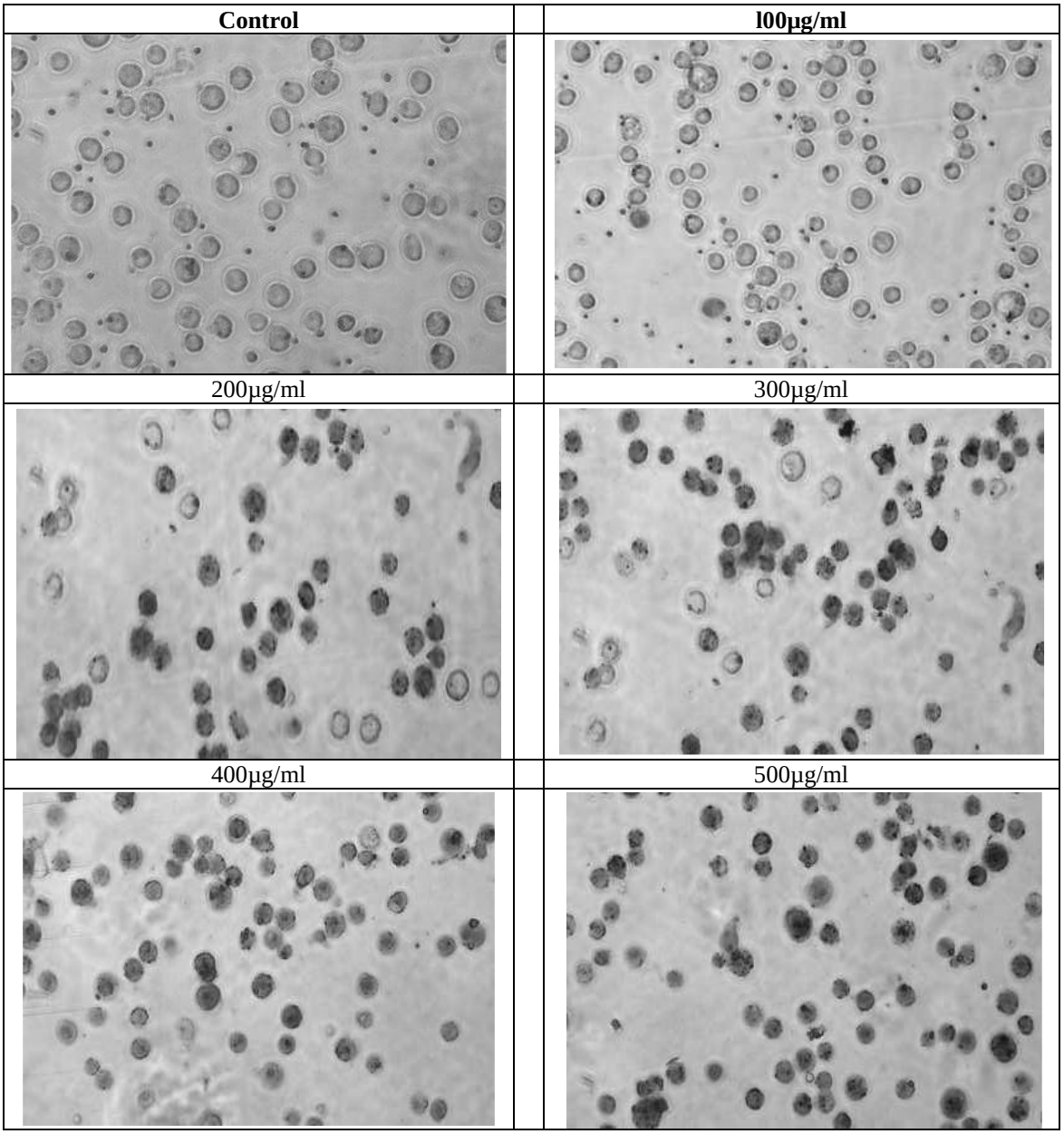

Fig 4: *In vitro* anticancer activity of methanol extracts of flower of *Tabebuia rosea* on HepG2 cell lines.

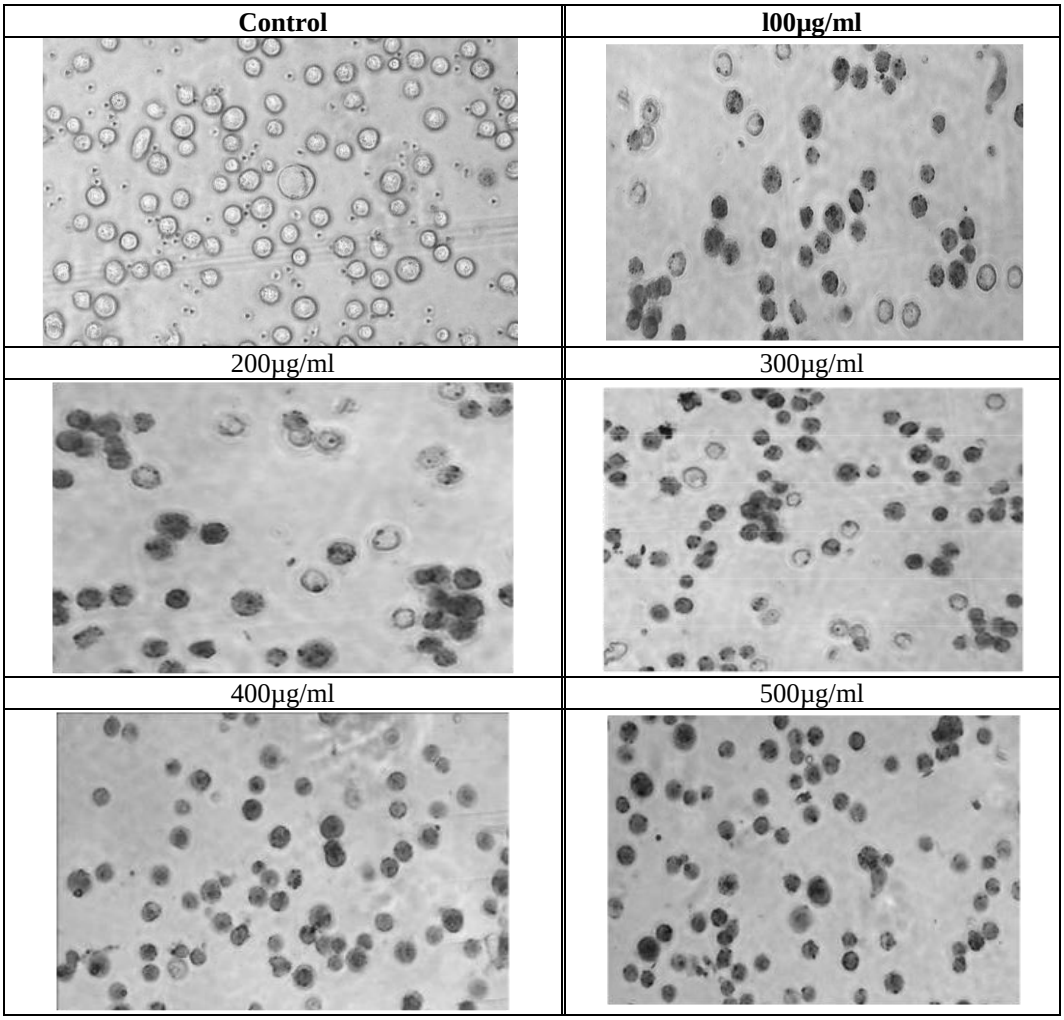

Fig 5: *In vitro* anticancer activity of methanol extracts of flower *Tabebuiarosea bark* on HepG2 cell lines.

The MTT measure of the compound detached from the ethyl acetic acid derivation division of blooms of *Tabebuia rosea* bark shows that all centers 1000µg/ml, 500 µg/ml, 250µg/ml, 125µg/ml and 62.5µg/ml show 74.95µg/ml, 69.43µg/ml, 58.12µg/ml, 49.52µg/ml, 43.86µg/ml are having anticancer activity against the human liver harmful development HepG2 cell line independently (23). Our results concordance with the earlier work done by Hiraganahalli *et al*. (24) where it has been represented that cytotoxic activity of Phyllanthus emblica, Camellia sinensis, Mangifera indica, Punica granatum, and Acacia catechu in HepG2 cell line against paracetamol hurtfulness. One more examination furthermore communicated the cytotoxic development of Polyalthiya longifolia natural items against carbon tetrachloride provoked harmfulness in HepG 2 cell line (25-27).

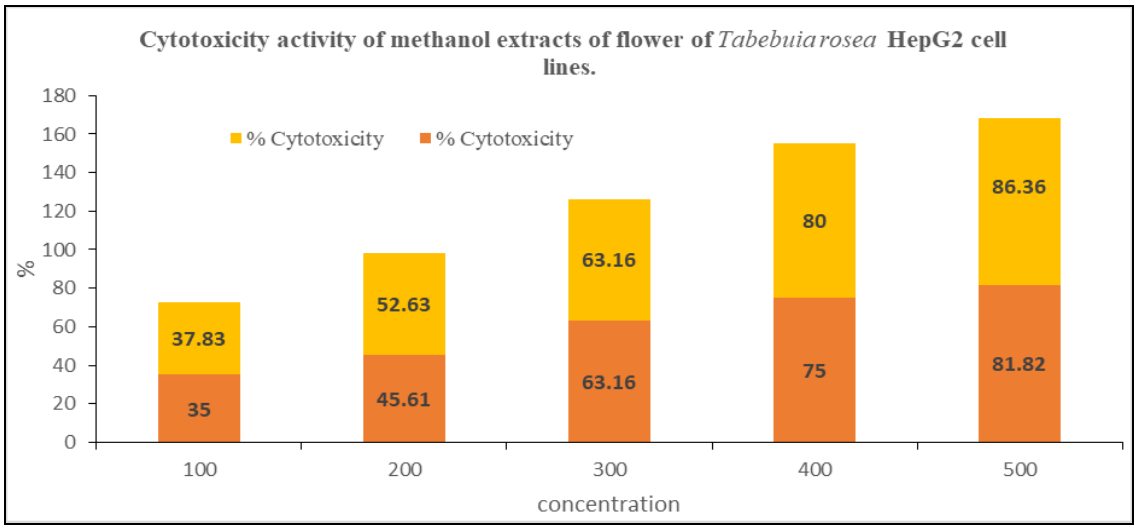

Fig 6: % Cytotoxicity activity of methanol extracts of flower of *Tabebuia rosea* HepG2 cell lines.

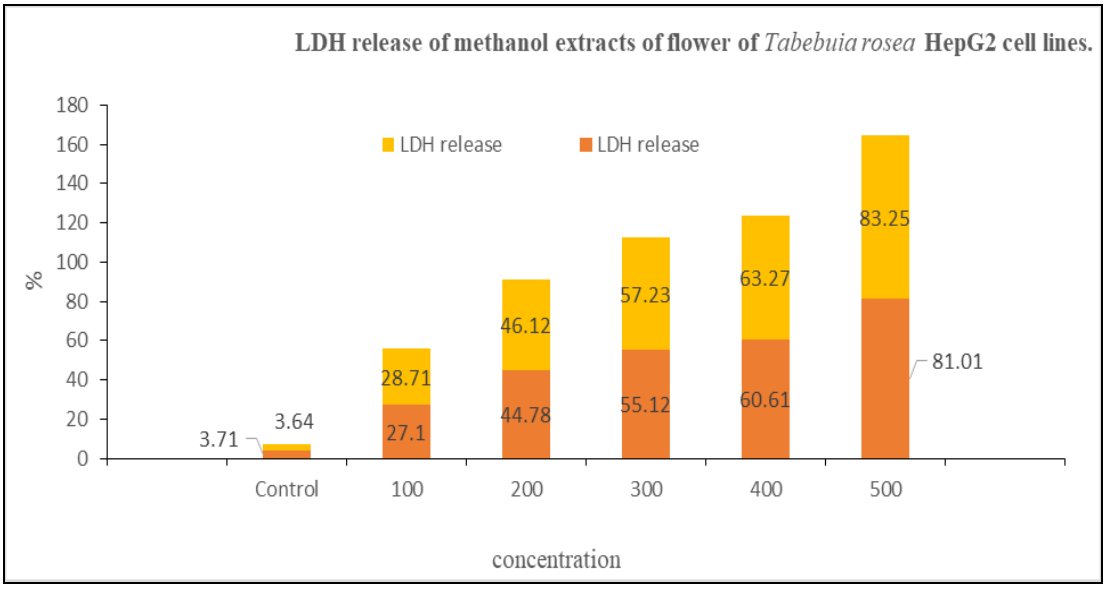

Fig 7: % LDH release of methanol extracts of flower of *Tabebuia rosea* HepG2 cell lines.

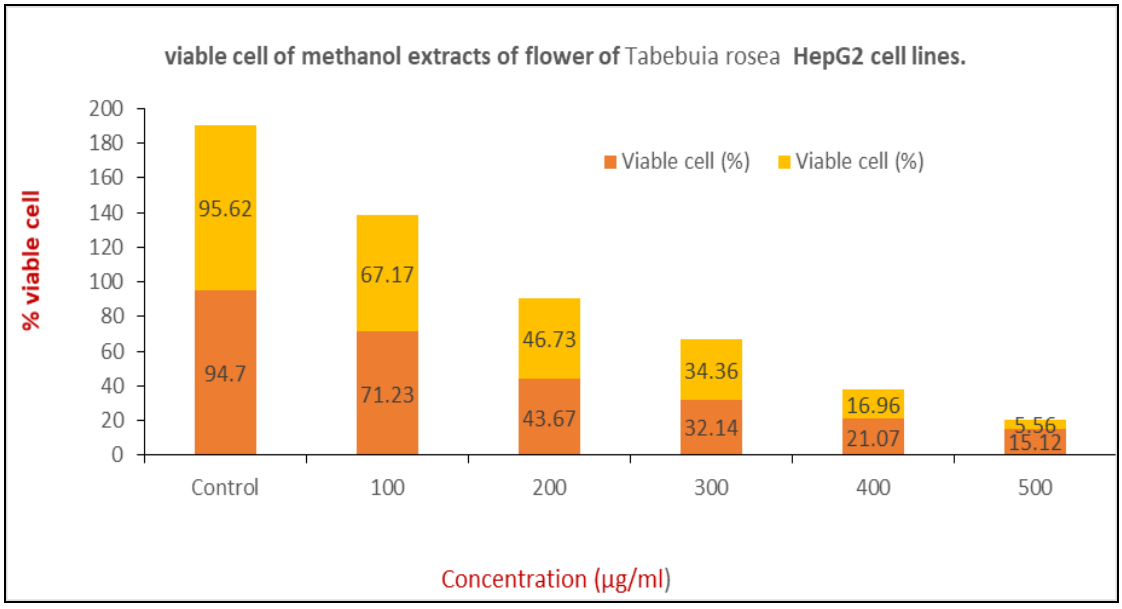

Fig 8: % viable cell of methanol extracts of flower of *Tabebuia rosea* HepG2 cell lines.

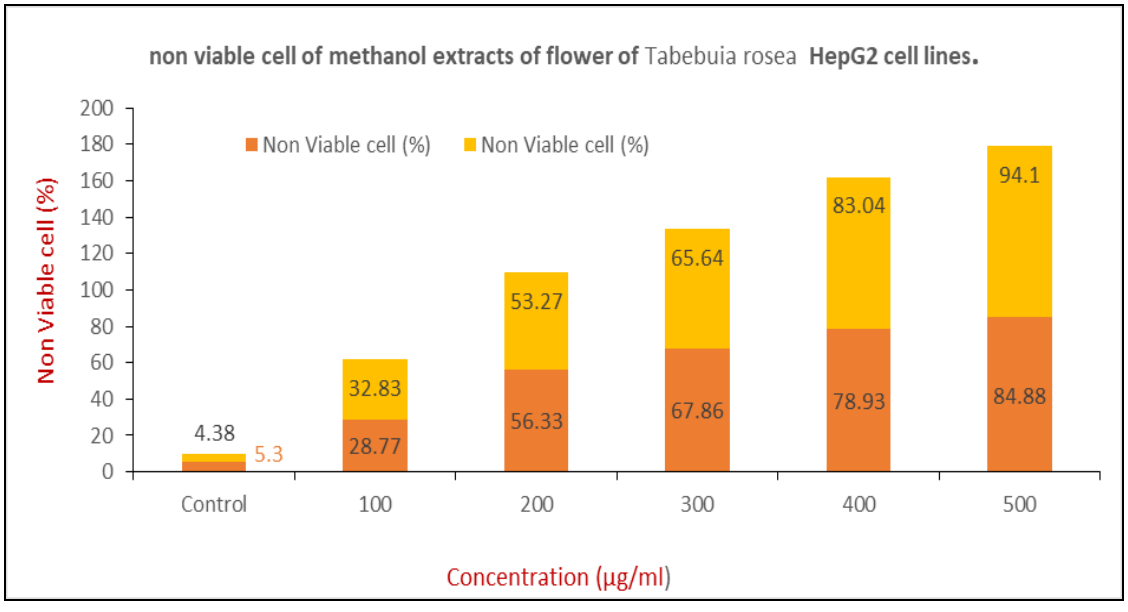

Fig 9: % non-viable cell of methanol extracts of flower of *Tabebuia rosea* HepG2 cell lines.

Conclusion

The energy evaluation revealed that *Tabebuia rosea* bark and flower can go most likely as a possible elective response for cell breakdown in the lungs. The concentrate of *Tabebuia rosea* bark and flower can be utilized as a persuading fixing in drug formula contamination. Further appraisal is embraced to perceive the amazing compound behind the cytotoxic movement of the plant. The assessment later on is to be associated with other peril cell lines and there is a need to do *in vivo* appraisals to additionally check the counter oxidant possibilities of this species Generally talking, it will overall be closed from the force assessment showed that methanol concentrate of *Tabebuia rosea* bark and flower ordinary things has indispensable *in vitro* cell support and easing rehearses were delineated.

Acknowledgements

The authors are grateful to Dr.R. Manikandan, MSc, MCA., MPhil., Ph.D., SET., Department of Chemistry, for providing laboratory facilities. Our special thanks to Department of Chmistry, AVVM Sri Pushpam College (Autonomous), Poondi 613503. for providing Lab. My financial support is my spouse.

Conflict of Interest Statement

We declare that we have no conflict of interest.

References

1. Velavan S. Free radicals in health and diseases. A mini review. *Pharmacology Onlin Newsletter*,2011:1:1062-1077.
2. Smith MA, Rottkamp CA, Nunomura A, Raina AK, Perry G. Oxidative stress in Alzheimer's disease. Biochim. Biophys. Acta,2000:1502:139-144.
3. Blokhina O, Virolainen E, Fagersted KV. Antioxidants, oxidative damage and oxygen deprivation stress: a review. Annals Bot,2003:91(2):17994.
4. Badarinath AV, RAo KM, Chetty CMS, Ramkanth V, Rajan TVS, Gnanaprakash K. A review on in-vitro antioxidant methods: comparisons, correlations and considerations, Int. J. PharmTech Res,2010:2(2):1276-1285.
5. Biometals, 12, 131-139.
6. Nur Alam MD, Nusrat Jahan Bristi M, Rafiquzzaman. Review on *in vivo* and *in vitro* methods evaluation of antioxidant activity. Saudi Pharmaceutical Journal,2013:21:143-152.
7. Shimada K, Fujikawa K, Yahara K, Nakamura T. Antioxidative properties of xanthan on the autoxidation of soybean oil in cyclodextrin emulsion. Journal of agricultural and food chemistry,1992:40(6):945-948.
8. Zhang Z. A flexible new technique for camera calibration. IEEE Transactions on pattern analysis and machine intelligence,2000:22(11):1330-1334.
9. Oyaizu M. Studies on product of browning reaction prepared from glucose amine. Japanese Journal of Nutrition,1986:44:307-315.
10. Nuutila AM, Puupponen-Pimiä R, Aarni M, Oksman-Caldentey KM. Comparison of antioxidant activities of onion and garlic extracts by inhibition of lipid peroxidation and radical scavenging activity. Food chemistry,2003:81(4):485-493.
11. Nagababu E, Ramasamy S, Abernethy DR, Rifkind JM. Active nitric oxide produced in the red cell under hypoxic conditions by deoxyhemoglobin-mediated nitrite reduction. Journal of Biological Chemistry,2003:278(47):46349-46356.
12. Youdim KA, Martin A, Joseph JA. Essential fatty acids and the brain: possible health implications. International journal of developmental neuroscience,2000:18(4-5):383-399.
13. Diplock AT. Will the 'good fairies' please prove to us that vitamin E lessens human degenerative disease?. Free radical research,1997:27(5):511-532.
14. Youdim KA, Shukitt-Hale B, Mackinnon S, Kalt W, Joseph JA. Polyphenolics enhance red blood cell resistance to oxidative stress, 2000.
15. Patil PH, Tidke PS, Prasad G. Jamkhande1. Int. J. Drug Dev. & Res,2013:5(3):0975-9344.
16. Priyanka Saha, Prakash Roy Choudhury, Subrata Das, Anupam Das Talukdar, Manabendra Dutta Choudhury. *In vitro* antioxidant activity of bark extracts of Oroxylum indicum (l) vent. Asian J Pharm Clin Res,2017:10(8):263-266.
17. Sofiane I, Seridi R, Cortes DM, Cabedo N. Phytochemical, 2018.
18. Ravishankar OD, Ravishankar AK, Rajora F, Greco HM, Osborn. Flavonoids as prospective compounds for antioxidant and anti-cancer therapy Int. J. Biochem. Cell Biol,2018:45(12):2821-2831.
19. Bouma ME, Rogier E, Verthier N, Labarre C, Feldmann G. Further ellular investigation of the human hepatoblastoma-derived cell line HepG2: Morphology and immunocytochemical studies of hepatic-secreted proteins. *In vitro* Cell Dev Biol,1989:25:267-75.
20. Kee NLA, Mnonopi N, Davids H, Nande RJ, Frost CL. Antithrombotic, anticoagulant and anticancer activities of selected medicinal plants from South Africa, African Journal of Biotechnology,2008:7:217-223.
21. Kee HL, Nicita A, Olarreaga M. Import demand elasticities and trade distortions. The Review of Economics and Statistics,2008:90(4):666-682.

22. Chen JK, Taipale J, Cooper MK, Beachy PA. Inhibition of Hedgehog signaling by direct binding of cyclopamine to Smoothened. Genes & development,2002:16(21):2743-2748.
23. Xu G, Zhou G, Jin T, Zhou T, Hammars trom S, Bergh A, Nord bergh G, 1999.
24. Solomon S, Muruganantham N, Senthamilselvi MM. Antimicrobial activity of Tabebuia rosea (flower).International Journal of Research and Development in Pharmacy and Life Science,2016:5(2):2018-2022.
25. Hiraganahalli BD, Velusami Chandrasekaran Chinampudur, Shekhar Dethe, Deepak Mundkinajeddu, Manoj Kumar Pandre, Jaya Balachandran *et al*. Hepatoprotective and antioxidant activity of standardized herbal extracts. Pharmacogn Mag,2012:8(30):116-123.
26. Rajangam J, Christina AJM. Evaluation of Hepatoprotective and antioxidant potential of methanolic extract of Polyalthiya longifolia fruits: An Invitro and In-vivo approach. Journal of Applied Pharmaceutical Science,2013:3(2):069076.
27. Pareek A, Godavarthi A, Issarani R, Nagori BP. Antioxidant and hepatoprotective activity of Fagonia schweinfurthii (Hadidi) Hadidi extract in carbon tetrachloride induced hepatotoxicity in HepG2 cell line and rats. J Ethnopharmacol,2013:150:973-81.