EJPMR, 2026, 13(9), 389-399 **Research Article** **Impact Factor: 8.158**

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

ISSN (O): 2394-3211
ISSN (P): 3051-2573
Coden USA: EJPMAG

FORMULATION AND EVALUATION OF HERBAL TABLET CONTAINING CURCULIGO CAPITULATA FOR HEPATOPROTECTIVE ACTIVITY

Naveen Kumar[1]*, Nishant Sharma[2], Dr. Abhishek Soni[2], Vineet Kapoor[2]

School of Pharmacy, Department of Pharmacy, Abhilashi University Chail Chowk, H.P. (Mandi)

***Corresponding Author: Naveen Kumar**

School of Pharmacy, Department of Pharmacy, Abhilashi University Chail Chowk, H.P. (Mandi)

DOI: https://doi.org/10.5281/zenodo.22686826

How to cite this Article: Naveen Kumar[1]*, Nishant Sharma[2], Dr. Abhishek Soni[2], Vineet Kapoor[2] (2026). Formulation And Evaluation Of Herbal Tablet Containing Curculigo Capitulata For Hepatoprotective Activity. European Journal of Pharmaceutical and Medical Research, 13(9), 389–399.

Article Received on 13/08/2026 **Article Revised on 03/09/2026** **Article Published on 10/09/2026**

ABSTRACT

Because of its many pharmacological characteristics, *Curculigo capitulata* is a medicinal plant that is frequently employed in traditional medicine. The goal of the current investigation was to assess *Curculigo capitulata* extract's hepatoprotective and antioxidant properties. DPPH and nitric oxide radical scavenging assays were used to evaluate the extract's antioxidant properties at various doses. The extract showed strong antioxidant capacity and concentration-dependent free radical scavenging activity. Its biological action could be attributed to the presence of phytochemical components like flavonoids and phenolics. The extract's antioxidant qualities point to a potential function in shielding liver cells from oxidative stress and damage. Overall, the results show that *Curculigo capitulata* may have hepatoprotective properties and is a promising natural source of antioxidants. Its therapeutic efficacy and mechanism of action need to be confirmed by more experimental and clinical research.

KEYWORDS: *Curculigo capitulata*, Hepatoprotective activity, Antioxidant activity, DPPH assay, Nitric oxide assay, Free radical scavenging, Medicinal plant, Phytochemicals.

INTRODUCTION

Medicinal plants play a very important role in the human health care. About 80% of the world populations rely on the use of traditional medicine which is predominantly based on plant materials.[1] Plants are rich in a variety of compounds. Many are secondary metabolites and include aromatic substances, most of which are phenols or their oxygen-substituted derivatives such as tannin.[2] Aromatic plants, herbs, and their essential oils have been used in traditional medicine, food preparation, and preservation, religious observances and cosmetic purposes for thousands of years. today, the use of plant extracts in feed additives, as sources of medicinal compounds, continues to grow, aiming to address the modern consumer's demands for natural, safe, and high-quality products.[3] Several herbal drugs have yielded important modern therapeutic agents e.g., aspirin, taxol and the Vinca alkaloids. Herbal medicines also play a significant and increasingly important role in global healthcare, where they are finding new and expanding markets as health foods and preventative medicines.[4] Since ancient times, mankind has made use of plants in the treatment of various ailments because their toxicity factors appear to have lower side effects.[5] Hundreds of plants have been so far examined to be taken for a wide spectrum of liver diseases.[6,7] Natural products, including herbal extracts, could significantly contribute to recovery processes of the intoxicated liver.[8] Liver is the most crucial and indispensable organ in the body with multifunctional capabilities. It is involved in the metabolism of nutrients such as lipids, proteins, and carbohydrates, as well as in the excretion of waste metabolites.[9] In addition, the liver is usually known as the biochemical unit of the body since it carries out all functions through different organs such as the mouth, skin, and lungs. It metabolizes substances in the bloodstream before they are distributed to the different parts of the body where they are needed.[10] The use of herbal medicines to treat liver diseases has increased worldwide, and this is due to the belief that herbal medicines are harmless and free from serious adverse reactions. In addition, they are available and easily obtained from nature. Moreover, the limited therapeutic choices and sometimes unsatisfactory therapeutic failure

of modern medicine have increased the usage of alternative medicine including herbal preparations.[11,12]. Liver diseases have become one of the major causes of morbidity and mortality in man and animals all over globe and hepatotoxicity due to drugs appears to be the most common contributing factor.[13] Among the many diseases that can affect the liver the most common is 'viral hepatitis' (Inflammation of liver caused by viral infection). Hepatitis can be caused by drugs, viruses, bacteria, mushrooms, parasites like amoebas or giardiasis. About 20,000 deaths found every year due to liver disorders. The use of natural remedies for the treatment of liver diseases has a long history and medicinal plants and their derivatives are still used all over the world in one form or the other for this purpose. Scientific evaluation of plants has often shown that active principles in these are responsible for therapeutic success. A large number of medicinal plants have been tested and found to contain active principles with curative properties against a variety of diseases.[14] The genus plant *Curculigo* belongs to the family Hypoxidaceae. This genus plant has diverse medicinal uses and is found in almost Indo-Asian countries. It has been reported that it contains approximately nine genera and 200 species, which are primarily found in the Old World's southern hemisphere and North America. Genus *Curculigo* plant has also diverse secondary metabolites such as phenolic, terpenoids, flavonoids, saponin glycosides tannins.[15,16] The genus *Curculigo* seek considerable attention due to its wide therapeutic uses which includes, antidiabetic activities possess by *C. latifolia, c.spp* and *C.pilos.*[17,19] anti-inflammatory and antioxidant activity.[20,21] Hepatoprotective effect.[22] So it was very interesting to select this plant (*Curculigo capitulata*) .it can help in the treatment of liver diseases. Main objective of study was to investigate the leaves of *curculigo capitulata* as a potent hepatoprotective drug. During the course of present investigation, pharmacological study and the formulation of extract as a tablet dosage form ,evaluation and in vitro parameters were studied.

Fig. 1: *Curculigo capitulate.*

MATERIALS AND METHODS

Collection and authentication of plant

The leaves of *Curculigo capitulata* were collected from Chailchowk Mandi (H.P) in the month of September, 2025. The plant was authenticated by Dr. Ved Prakash Assistant Professor Botany Govt. College Bassa, Gohar, Mandi (H.P).

Materials used

Magnesium stearate, Talc, Sodium Starch glycolate are procured by Loba chemise Pvt. Ltd. Laboratory in Mumbai, Maharashtra .Lactose, microcrystalline cellulose, PVP K_{30} are procured by Qualikems fine chem. Pvt. Ltd. Kapra, Hyderabad

Method of extraction

Hot Continuous Extraction (Soxhlet)

Material used for extraction

i. Soxhlet apparatus
ii. Ethanol
iii. Distilled water
iv. Shade dried coarse powder of rhizomes of *Curculigo capitultata*

Fig. 2: Soxhlet extraction.

Procedure

The shade dried coarsely powdered leaves of *Curculigo capitulata* (100gms) was extracted with ethanol at temperature of 60-70 °C until it become transparent. After completion extraction, the solvent was removed by re distillation assembly. Dark green colored residue was obtained. The residue was then stored in a desicator.

Fig. 3: Re Distillation assembly.

Pre Formulation Study

Angle of Repose

It is the greatest angle that can be formed between the horizontal plane and the powder heap's freestanding surface. The fixed funnel method was used to determine it. A predetermined quantity of powder medication was transferred to the funnel while the funnel's opening was blocked with a thumb. After the powder was removed from the funnel, its angle of repose was measured in θ.[23]

Angle of repose (θ) = $\tan^{-1}$ h/r

Bulk density

It is the powder's bulk mass divided by its bulk volume. Bulk density is used to determine homogeneity, and it is represented by ρ_b.

Bulk density (ρ_b) = M/Vb

Where, M is the mass of the sample, Vb bulk volume

Tapped density

It is the ratio of the powder's weight to the measuring cylinder's minimum volume. A graduated cylinder with a specified mass of medication or formulation is placed on a mechanical tapper device that is run at a fixed number of taps (1000) until the powder bed reaches a minimum volume in order to measure the tapped density.[24]

Tapped density (pt) = weight of powder blend/minimum volume occupied by the cylinder

Compressibility indices

a. Carr's index

The following formula was used to calculate the powder mixture's percentage compressibility based on the apparent bulk density and the tapped density.

Carr's index = Tapped density-Bulk density × 100/ Tapped Density

b. Hausner's ratio

It is an indirect indicator of how simple it is to measure powder flow. Better flow characteristics are indicated by a lower Hausner's ratio (<1.25) than by a higher one (>1.25).[25]

Hausner's ratio=Tapped density /Bulk density

Formulation of Herbal Tablets

The carefully weighed quantities of *Curculigo capitulata* extract and excipients were separately passed through filter number 60 to produce a uniform particle size. The extract, lactose, and starch were thoroughly mixed in a mortar and pestle to produce a homogenous powder blend. A sufficient amount of starch paste was made by dissolving starch in warm distilled water, and this paste was then used as a binding agent. To create a cohesive moist mass, the powder mixture was progressively combined with the binder solution. The wet bulk was passed through sieve number 10 to produce wet granules. The generated granules were dried in a hot air oven at the proper temperature until they were totally dry. The dried granules were passed through filter number 22 once again to obtain equally sized granules. Finally, the dried granules were mixed with magnesium stearate and talc and swirled gently for a few minutes. The lubricated granules were compressed into tablets using a hand operator punching machine.

Fig. 4: Hand Operated Punching Machine.

Evaluation of post compression tablets

Physical appearance

Tablet was studied visually by its shape, color, texture and odor.

Thickness

Tablet thickness was calculated with the help of vernier caliper. Tablet was put in between two jaws vertically and measured thickness and expressed in mm.

Weight variation

A digital balance was used to weigh each of the twenty tablets that were chosen at random; the average weight was computed and contrasted with the weights of individual tablets.

Hardness

Another name for hardness is tablet crushing strength. A Monsanto hardness tester was used to gauge the tablet's hardness. The tablet was positioned lengthwise between the upper and lower plungers, and its hardness was measured in kgs by applying force with a threaded bolt until the tablet broke.

Friability

It is determined by the Roche Friabilator, which uses a plastic chamber that rotates at 25 rpm to submit many tablets to the combined effects of shock and abrasion. The tablet ran for 100 revolutions when dropped from an inch away. Friability should be less than 1%, according to the standard limit, after pre weighed tablets were dusted and re-weighed. It is computed using a formula.

%friability = initial weight – final weight / initial weight

Disintegration

USP disintegration equipment was used to conduct the disintegration test. The time it took for the tablets to completely disintegrate was noted after they were put in a basket rack assembly with distilled water kept at 37 ± 2°C.

In Vitro Parameters

DPPH Radical Scavenging Assay

- ✓ **Principle:** 2, 2-Diphenyl-1-picrylhydrazyl, or DPPH, is a deep violet, stable free radical. The herbal extract's antioxidants lessen DPPH radicals, which lowers absorbance at 517 nm.

- ✓ **Reagent Preparation**
  - i. **Solution of DPPH (0.1 mM):** Weigh 3.94 milligrams of DPPH .In 100 ml of methanol dissolve. Keep out of direct sunlight and store in a dark bottle.
  - ii. **Standard solution:** Make solutions of 20, 40, 60, 80, and 100 µg/mL of ascorbic acid in methanol.
  - iii. **Sample Solution:** In methanol, dissolve the powdered tablet extract or herbal extract. Make 20, 40, 60, 80, and 100 µg/mL concentrations.

✓ **Procedure:** Measure absorbance at 517 nm using a UV-Visible spectrophotometer; use methanol as the blank; add 1 ml of sample or standard solution to a test tube; add 1 ml of 0.1 mm DPPH solution; vortex or thoroughly mix; incubate in the dark at room temperature for 30 minutes; and repeat each measurement three times.

✓ **Calculation**

% Inhibition= $A_{control} - A_{Sample} / A_{control} * 100$

Where

- $A_{control}$ = Absorbance of control
- A_{sample} = Absorbance of sample

Nitric Oxide (NO) Scavenging Assay

✓ **Principle:** Nitric oxide (NO) is spontaneously produced by sodium nitroprusside in aqueous solution at physiological pH. Nitrite ions are created when nitric oxide and oxygen combine. The Griess reagent and these nitrite ions combine to form a pink chromophore that may be detected spectrophotometrically at 546 nm. The test sample's antioxidants suppress nitrite synthesis by competing with oxygen, which lowers absorbance.

✓ **Procedure:** Prepare different concentrations of the herbal extract/formulation.

Mix:

- ml sodium nitroprusside solution
- 0.5 ml phosphate buffer
- 0.5 ml test sample

The reaction mixture should be incubated for 150 minutes at 25°C. Take 0.5 ml of the incubated mixture once it has been incubated. Add the sulphanilamide reagent (1 ml). Give it five minutes to stand. Pour in one milliliter of the naphthyl ethylenediamine dihydrochloride solution. Let it sit at room temperature for half an hour. Compare the absorbance at 546 nm to the blank. For regular ascorbic acid, use the same steps.

✓ **Calculation**

Percentage Inhibition=$A_c - A_t / A_c \times 100$

Where:

A_c= Absorbance of control

A_t= Absorbance of test sample

RESULTS

Table 1: Preliminary phytochemical analysis.

Sr. no.	Test	Results
1.	Terpenoids	+
2.	Flavanoids	+
3.	Polysaccharides and proteins	_
4.	Phenols	+
5.	lignans	_
6.	Phenolic glycosides	+
7.	Steroids	_

Table 2: Composition of Herbal Tablet.

Chemicals	F_1	F_2	F_3	F_4
API	200 mg	200 mg	200 mg	200 mg
MCC	193.5 mg	178.4 mg	196.9 mg	190 mg
PVP K30	25.8 mg	19.4 mg	36.4 mg	30 mg
Sodium starch glycolate	12.9 mg	25.9 mg	12.1 mg	30 mg
Talc	9.7 mg	9.7 mg	9.1 mg	10 mg
Magnesium stearate	12.9 mg	9.7 mg	12.1 mg	10 mg
Starch	12.9 mg	25.9 mg	12.1 mg	40 mg
Total	500 mg	500 mg	500 mg	500 mg

Table 3: Pre formulation studies of herbal fried extract.

Sr. no	Parameters	Trial 1	Trial 2	Trial 3	Trial 4
1.	Angle of repose	29.4	28.5	30.2	27.6
2.	Bulk density	0.42	0.43	0.46	0.49
3.	Tapped density	0.51	0.53	0.55	0.58
4.	Carr's index	17.65	18.87	16.36	15.52
5.	Hausner's ratio	1.21	1.23	1.20	1.18

Fig. 5: Prepared Herbal Tablets (500 mg).

Table 4: Evaluation of Herbal Tablet.

Sr. no.	Parameters	Observations
1.	Appearance	Round ,uncoated tablet
2.	Color	Greenish -grey to light green
3.	Odor	Characteristic odor
4.	Taste	Bitter
5.	Shape	Round

Table 5: Evaluation flow properties of herbal tablet various batch.

Sr. no.	Parameters	F1	F2	F3	F4
1.	Weight variation (%)	498.8	501.2	500.5	499.9
2.	Hardness (kg/cm²)	6.5	5.4	6.9	7.1
3.	Thickness (mm)	3.82	3.79	3.86	3.80
4.	Diameter (mm)	8.98	9.00	9.00	9.01
5.	Friability (%)	0.49	0.52	0.47	0.45
6.	Disintegration time (minutes)	9.30	8.10	11.41	13.27

UV-Visible Spectral Analysis

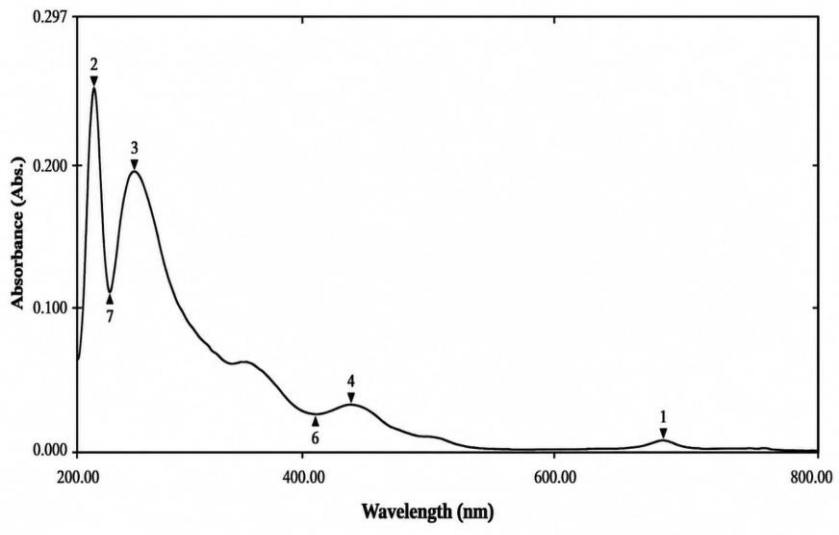

Fig. 6: UV-Visible absorption spectrums of the tablet extract containing *C. capitulate.*

The UV–Visible absorption spectrum of the herbal tablet extract was obtained using a Shimadzu UV-1900 Series spectrophotometer across the 200–800 nm wavelength range. The spectrum showed a primary absorption maximum (λ max) at 209 nm with an absorbance value of 0.243, along with a notable peak at 236 nm (absorbance 0.196) and a smaller one at 221 nm (absorbance 0.114). Absorbance levels above 300 nm were minimal, suggesting that the main UV-absorbing plant compounds are primarily active in the lower ultraviolet region. These characteristic peaks indicate the

presence of phytochemicals with conjugated systems and aromatic structures within the herbal formulation.

Table 6: UV-Visible absorption peaks of the tablet extract containing of *Curculigo capitulate.*

Peak No.	Wavelength(nm)	Absorbance
1	209 nm	0.243
2	236 nm	0.196
3	221 nm	0.114
4	405 nm	0.027

HPLC Fingerprint Chromatogram

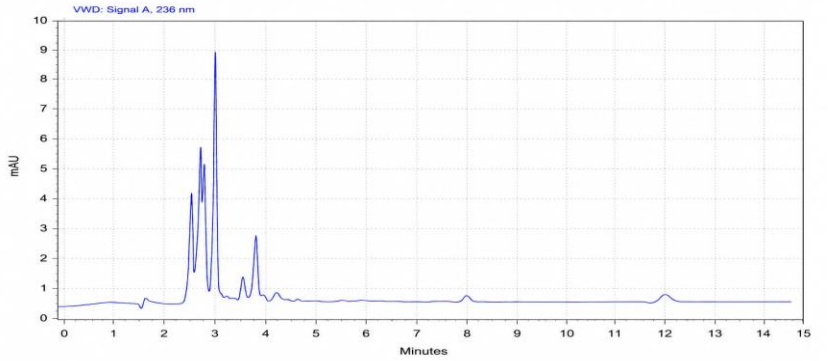

Fig. 7: HPLC fingerprint chromatogram of the tablet extract containing *Curculigo capitulata* recorded at 236 nm.

The HPLC fingerprint of the herbal extract was obtained using a detection wavelength of 236 nm. The resulting chromatogram displayed several well-separated peaks, reflecting the presence of diverse phytochemical components in the extract. A dominant peak emerged at a retention time of about 2.9 to 3.0 minutes, showing the strongest signal and indicating it is the primary constituent. Other noticeable peaks appeared between approximately 2.3 and 4.5 minutes, with a few smaller ones detected later, around 7.5 and 12.0 minutes. The overall pattern of multiple peaks highlights the extract's complex chemical makeup and serves as a distinctive chromatographic profile, valuable for quality assessment and sample identification.

In vitro Dissolution Study

Table 7: In vitro dissolution profile of the herbal tablet containing *Curculigo Capitulata.*

Time (min.)	F1	F2	F3	F4
5	23.2±0.6	25.7 ± 0.5	26.4 ± 0.5	27.5 ± 0.4
10	31.1 ± 0.7	32.4 ± 0.6	32.8 ± 0.6	34.6 ± 0.5
15	38.3 ± 0.8	41.1 ± 0.7	42.1 ± 0.7	44.2 ± 0.6
20	52.5 ± 0.9	53.7 ± 0.8	55.7 ± 0.5	57.4 ± 0.5
25	64.3 ± 1.0	67.6 ± 0.9	70.4 ± 0.8	71.2 ± 0.8
30	73.1 ± 1.1	74.1 ± 1.0	79.7 ± 1.0	80.4 ± 0.9
35	83.4 ± 1.2	85.4 ± 1.1	88.1 ± 1.1	87.3 ± 1.0
40	91.5 ± 1.1	93.6 ± 1.0	94.2 ± 1.0	96.4 ± 0.9
45	96.4 ± 0.9	98.4 ± 0.8	98.1 ± 0.7	99.4 ± 0.6

The in vitro dissolution test showed a steady rise in cumulative drug release across all formulations (F1–F4) over the 45-minute duration. By the 5-minute mark, drug release varied between 23.2 ± 0.6% for F1 and 27.5 ± 0.4% for F4. All formulations exhibited a consistent increase in release over time, reflecting favorable dissolution performance. After 45 minutes, the cumulative release reached 96.4 ± 0.9% (F1), 98.4 ± 0.8% (F2), 98.1 ± 0.7% (F3), and 99.4 ± 0.6% (F4).Of the four, F4 achieved the highest release, indicating superior dissolution efficiency.

In general, each formulation released over 95% of the drug within the allotted time, meeting expected dissolution standards for conventional herbal tablets**.**

Dissolution Profile Graph Data

In- Vitro Release Profile of Formulation F1-F4

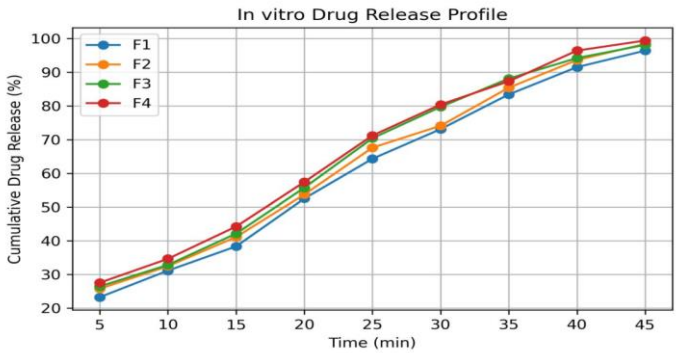

Fig. 8: In –Vitro Drug Release Profile of *Curculigo capitulata* Herbal Tablet Formulations (F1-F4).

Table 8: Calibration data of tablet extract at 236 nm.

Sr . No.	Concentration (µg/mL)	Absorbance (236 nm)
1	2	0.114
2	4	0.136
3	6	0.158
4	8	0.197
5	10	0.216
6	12	0.247
7	14	0.280
8	16	0.298
9	18	0.322

Linear Regression
Regression equation
$y=0.0134x+ 0.0843$, $R^2=0.9960$

Where: y= Absorbance, x= Concentration (µg/mL)

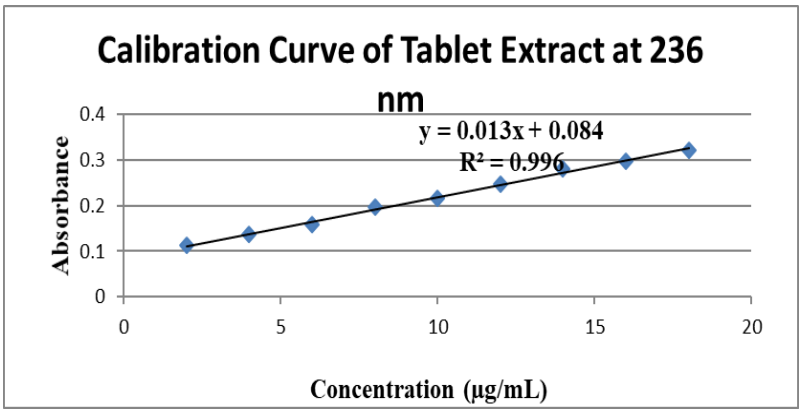

Fig. 9: Calibration Curve of Herbal Tablet Extract at 236 nm.

A UV-Visible spectrophotometer was used to measure the absorbance of standard solutions at 236 nm in order to create a calibration curve for the herbal tablet extract. In accordance with Beer-Lambert's law, the absorbance rose linearly with increasing concentration over the range of 2–18 µg/mL.

The regression equation that was found was:
y = 0.013x + 0.084, where x is concentration (µg/mL) and y is absorbance.

The calibration curve's good linearity was indicated by the coefficient of determination (R^2 = 0.996). Consequently, the drug content released during the in vitro dissolution research was determined using the devised UV spectrophotometric method, which was deemed appropriate for the quantitative evaluation of the herbal tablet extract.

DPPH Radical Scavenging Assay
DPPH radical scavenging activity was concentration-dependent in the *Curculigo capitulata* extract. At 20 µg/mL, the percentage inhibition was 24.3%; at 100 µg/mL, it was 86.4%. With inhibition ranging from 48.9% to 96.3% throughout the same dosage range, the standard, ascorbic acid, demonstrated greater antioxidant activity. These results show that the extract has a

considerable amount of antioxidant potential, however not as much as the standard.

Table 9: DPPH Radical Scavenging Activity of Formulated *Curculigo capitulata* Herbal Tablet.

Concentration (µg/mL)	Herbal Tablet(% Inhibition)	Ascorbic Acid (% Inhibition)
20	24.3	48.9
40	43.4	69.6
60	59.1	82.4
80	73.8	91.6
100	86.4	96.3

Dose Response Curve

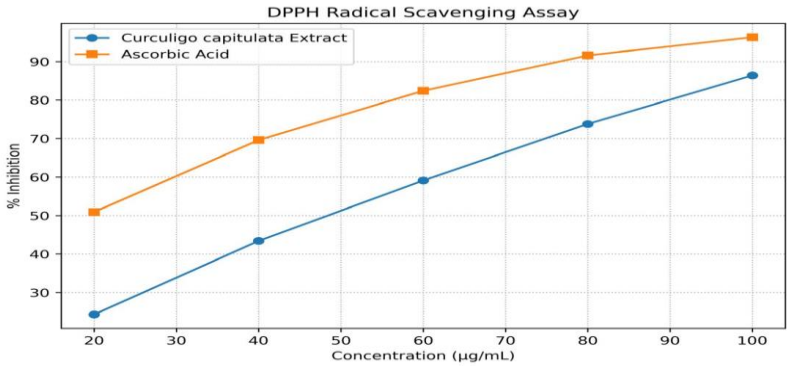

Fig. 10: DPPH Radical Scavenging Activity of the Herbal Tablet and Ascorbic Acid.

Table 10: IC_{50} Values of the Herbal Tablet and Ascorbic Acid.

Sample	IC_{50}(µg/mL)
Herbal Tablets	48.41 µg/mL
Ascorbic Acid	21.06.0 µg/mL

IC_{50} Determination

The DPPH radical scavenging assay's concentration–response curves were used to estimate the IC_{50} values. The normal ascorbic acid had an estimated IC_{50} of 21.06 µg/mL, while the manufactured *Curculigo capitulata* herbal tablet had an estimated IC_{50} of 48.41 µg/mL. Ascorbic acid's higher antioxidant effectiveness as compared to the prepared herbal tablet is indicated by its lower IC_{50} value.

Nitric Oxide Scavenging Assay

Curculigo capitulata extract's ability to scavenge nitric oxide radicals was assessed at various doses and contrasted with ascorbic acid, a common antioxidant. Nitric oxide scavenging activity was increased by the extract in a concentration-dependent manner, with percentage inhibition rising from 20.3% at 20 µg/mL to 78.9% at 100 µg/mL. Ascorbic acid, on the other hand, exhibited greater inhibition, ranging from 45.1% at 20 µg/mL to 95.8% at 100 µg/mL. Although it is less than that of the standard, these findings show that the *Curculigo capitulata* extract has a considerable amount of nitric oxide radical scavenging action.

Table 11: Nitric Oxide Scavenging Activity of Formulated *Curculigo capitulata* Herbal Tablets.

Concentration (µg/mL)	Herbal Tablet(% Inhibition)	Ascorbic Acid (% Inhibition)
20	20.3	45.1
40	38.5	62.3
60	55.4	78.1
80	68.1	86.6
100	78.9	95.8

Dose Response Curve

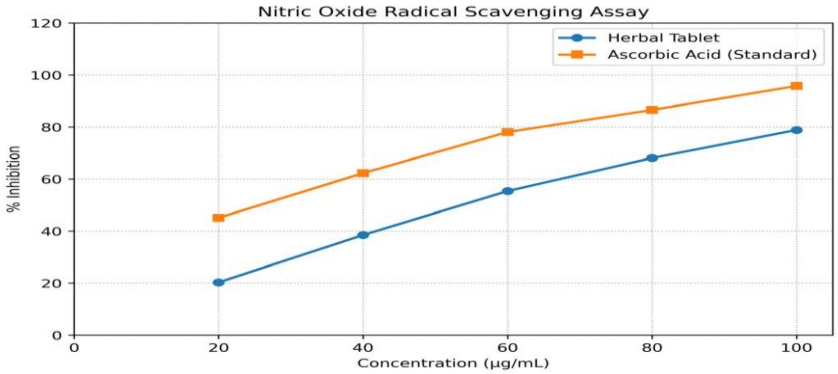

Fig. 11: Nitric Oxide Scavenging Activity of the Herbal Tablet and Ascorbic Acid.

Table 12: IC_{50} Values of the Herbal Tablet and Ascorbic Acid.

Sample	IC_{50}(µg/mL)
Herbal Tablets	53.61 µg/mL
Ascorbic Acid	25.70 µg/mL

IC_{50} Determination

The concentration–response curves of the nitric oxide radical scavenging experiment were used to estimate the IC_{50} values. The conventional ascorbic acid had an estimated IC_{50} of 25.70 µg/mL, while the manufactured Curculigo capitulata herbal tablet had an estimated IC_{50} of 53.61 µg/mL. Ascorbic acid has a higher nitric oxide potency than the manufactured herbal pill, as seen by its lower IC_{50} value.

CONCLUSION

The goal of the current study was to create and assess a herbal tablet formulation with extract from *Curculigo capitulata* for possible hepatoprotective effects. The wet granulation process was used to generate five formulations (F1–F4), and their pre-compression and post-compression properties were assessed. The acceptable pharmaceutical quality parameters, which include flow characteristics, weight variation, hardness, friability, thickness, and disintegration time, were all met by all formulations.F4 was chosen as the best formulation out of the five due to its good physicochemical characteristics. The optimized formulation was suitable for additional in vitro testing since it demonstrated adequate hardness, low friability, a sufficient disintegration time, and good overall tablet quality**.** The optimized formulation (F4) demonstrated significant biological activity. It exhibited 86.4% DPPH radical scavenging activity and 78.9% Nitric oxide scavenging activity, indicating strong antioxidant potential. The in vitro dissolution study demonstrated satisfactory drug release, indicating that the formulated tablet is capable of releasing the active constituents effectively under the test conditions. Overall, the results of this investigation show that the created *Curculigo capitulata* herbal tablet has promising antioxidant properties in addition to desired medicinal qualities. The optimized formulation's potential as a candidate for additional research as a herbal hepatoprotective formulation is supported by these findings. However, before clinical application, more stability testing, in vivo pharmacological research, and clinical trials are needed to confirm its safety, effectiveness, and therapeutic relevance.

REFERENCES

1. Chandira M, Jayakar B. Formulation and evaluation of herbal tablets containing ipomoea digitata Linn.extract. Extraction., 2010 Jul; 3(1): 022.
2. A. Madani, N. Mazouni, M. Nedjhioui, A. Madani, N. Mazouni, and M. Nedjhioui, "Plants' Bioactive Metabolites and Extraction Methods," *Bioact. Compd. - Biosynthesis, Charact. Appl.*, 2021; 1–6.
3. I. Giannenas, E. Sidiropoulou, E. Bonos, E. Christaki, and P. Florou-Paneri, *The history of herbs, medicinal and aromatic plants, and their extracts: Past, current situation and future perspectives*. Elsevier Inc., 2019. doi:10.1016/B978-0-12-814700-9.00001-7.
4. helen sheridan jandrik sendker, "History and Current Status of Herbal Medicines," *Am. jouirnal Heal. Syst.*, vol. 4, no. 2023; 5: 2023.
5. AA Elberry, FM Harraz, SA Ghareib, SA Gabr, AA Nagy, E Abdel-Sattar Methanolic extract of *Marrubium vulgare* ameliorates hyperglycemia and dyslipidemia in streptozotocin-induced diabetic rats Int J Diabetes Mellit, 2011; 11: 1877-1878.
6. M Asadi-Samani, M Rafieian-Kopaei, N Azimi Gundelia: a systematic review of medicinal and molecular perspective Pak. J Biol. Sci., 2013; 16: 1238-1247.
7. M Asadi-Samani, M Bahmani, M Rafieian-Kopaei The chemical composition, botanical characteristic and biological activities of *Borago officinalis*: a review Asian Pac. J Trop. Med., 2014; 7: 22-28.
8. A McBride, KM Augustin, J Nobbe, P Westervelt *Silybum marianum* (milk thistle) in the management and prevention of hepatotoxicity in a patient undergoing reinduction therapy for acute myelogenous leukemia J Oncol Pharm Pract, 2012;

18: 360-365.
9. Abhilash G, Maheswari YJ, Gopal A, Chanda D. Review on some medicinal plants with hepato-protective activities. Res Rev J Pharmacogn Phytochem, 2014; 22: 33.
10. Nayak SS, Jain R, Sahoo AK. Hepatoprotective activity of Glycosmis pentaphylla against paracetamol-induced hepatotoxicity in Swiss albino mice. Pharm. Biol., 2011; 49: 111-7.
11. Girish C., Koner B. C, Jayanthi S, Rao K. R, Rajesh B, and Pradhan S. C, Hepatoprotective activity of six polyherbal formulations in paracetamol induced liver toxicity in mice, *Indian Journal of Medical Research*., 2009; 129(5): 569–578.
12. Ali S. A., Al-Amin T. H., Mohamed A. H., and Gameel A. A., Hepatoprotective activity of aqueous and methanolic extracts of *Capparis decidua* stems against carbon tetrachloride induced liver damage in rats, *Journal of Pharmacology and Toxicology*., 2009; 4(4): 167–172.
13. Tiwari V, Shandily S, Albert J, Mishra V, Dikkatwar M, Singh R, Sah SK, Chand S, Insights into medication-induced liver injury: Understanding and management strategies, Toxicology Reports, 2025; 14: 102068.
14. Khatri, R., & Dhiman, *A., A Review on Hepatoprotective Potential of Some Indigenous Medicinal Plants. SysRev Pharm* [Systematic Reviews in Pharmacy], 2023; 14(8): 520-529.
15. Wang Y, Li J, Li N. Phytochemistry and pharmacological activity of plants of genus Curculigo. Molecules., 2021; 26(11): 3396.
16. Bhukta P, Ranajit SK, Sahu PK, Rath D. Phytochemistry and pharmacology of curculigo orchioides gaertn: a review.J Appl. Pharm. Sci., 2023.
17. Ishak NA, Hamid M. Universiti Putra Malaysia, Z NA, Antidiabetic property of medicinal plants in malaysia. J Sustain Sci. Manag., 2021; 16(8): 307–22.
18. Karigidi KO, Akintimehin ES, Omoboyowa DA, Adetuyi FO, Olaiya CO. Effect of Curculigo pilosa supplemented diet on blood sugar, lipid metabolism, hepatic oxidative stress and carbohydrate metabolism enzymes in streptozotocin-induced diabetic rats. J Diabetes Metab. Disord., 2020; 19(2): 1173–84.
19. Umar AH, Ratnadewi D, Rafi M, Sulistyaningsih YC, Hamim H, Kusuma WA. Drug candidates and potential targets of Curculigo spp compounds for treating diabetes mellitus based on network pharmacology, molecular docking and molecular dynamics simulation. J Biomol Struct Dyn., 2023; 41(17): 8544–60.
20. Li Q, Tian C, Liu X, Li D, Liu H. Anti-inflammatory and antioxidant traditional Chinese Medicine in treatment and prevention of osteoporosis. Front Pharmacol., 2023; 27(14): 1203767.
21. Kushalan S, Yathisha UG, Khyahrii SA, Hegde S. Phytochemical and anti-oxidant evaluation of in vitro and in vivo propagated plants of Curculigo orchioides. Vitro Cell Dev Biol. - Plant., 2022; 58(3): 382–91.
22. Sreshta B, Babu SR. Hepatoprotective effect of Poly herbal formulation containing indigenous medicinal plants against various hepatotoxic agents in rats. Asian J Pharm. Pharmacol., 2018; 4(2): 232–7.
23. Lachman Leon, Lieberman Herbert A, Kanig Joseph L. The theory and practice of industrial pharmacy. 3rd edition Varghese publishing house, 2009; 182-184: 296-303.
24. Aulton ME: Pharmaceutics the science of dosage design. Churchill Livingstone Second edition, 2002; 134.
25. Bhope SG, Nagore DH, Kuber VV, Gupta PK, Patil MJ. Design and development of stable polyherbal formulation based on results of compatibility studies. Pharmacognosy Res., 2011 Apr-Jun; 3(2): 122–129.