RESULTS

In the present investigation, whole plant of *C. zeylanicum* has been subjected to pharmacochemical characterization, GC-MS analysis, LC-MS analysis, antioxidant, anticancer, antidiabetic, hepatoprotective, antifertility and antiinflammatory activities with a view to assess its pharmacological potentials.

**Analyses of the powdered drug**

**Ash and extractive values**

The results of the ash and extractive values of whole plant powder of *C. zeylanicum* are depicted in Table 1a and 1b. The total ash content of the powdered whole plant of *C. zeylanicum* is 10.84%. The present study revealed that the extractive value of water extract is more than the extractive values of other solvent extracts investigated.

**Fluorescence analysis**

The results of fluorescence analysis of whole plant powder of *C. zeylanicum* are shown in Table 2. The whole plant powder of *C. zeylanicum*, as such, fluoresced green under day light and short UV light (254 nm) and dark green under long UV light (365 nm). The powdered plant drug emitted the characteristic fluorescent green colour when treated with 50% sulphuric acid, concentrate nitric acid, 50% nitric acid, 40% sodium hydroxide + 10% lead acetate, ammonia, acetone and ethanol.

**Preliminary Phytochemical Screening**

The distribution of different phytochemical constituents in petroleum ether, chloroform, methanol and ethanol extracts of whole plant powder of *C. zeylanicum* were evaluated qualitatively and the results are presented in Table 3. The presence of phytocompounds such as alkaloids, anthraquinones, catechins, coumarins, flavonoids, phenols, quinones, saponins, steroids, tannins, terpenoids, sugars and glycosides have
been confirmed in the methanol and ethanol extracts of the selected plant. In addition to the above compounds, the presence of xanthoprotein is noticed in the ethanol extract of experimental plant.

**Total phenolic content and total flavonoid content**

The total phenolic content and total flavonoid content of the whole plant methanol extract of *C. zeylanicum* are found to be 0.48g/100g⁻¹ and 0.64g/100g⁻¹ respectively.

**HPTLC analysis**

The HPTLC profiles of alkaloid, coumarin, glycoside, steroid and phenol in day light and UV lights at 254 nm and 366 nm wave length are given in Plates I – V. The Rf values, peak area and the assigned substances are given in Tables 4 – 8. The HPTLC densitograms of alkaloid, coumarin, glycoside, steroid and phenol are given in Figures 1 – 5. The HPTLC results showed that the ethanol extract of selected plant had more amount of coumarin (12 types) followed by glycoside (11 types), phenol (10 types), steroids (7 types) and alkaloid (5 types).

**GC – MS analysis**

The chemical composition of whole plant ethanol extract of *C. zeylanicum* was analysed by using GC–MS. The chromatogram of the whole plant powder of *C. zeylanicum* was shown in Figure 6. Mass spectra were used to identify the structure of the compounds found by comparing with those in NITS ver 2.1 (National Institute of Standards and Technology) library. Twenty compounds were detected in ethanol extract of *C. zeylanicum* whole plant (Table 9). The results revealed that 9,12-Octadecadienoic acid(Z-Z)- (44.18%), n-Hexadecanoic acid (15.46%), Borazine 2,4,6-trimethyl (9.39%), Oleic acid (4.76%), 9,12-Octadecadienoyl chloride,
(Z-Z)- (4.00%), Isosorbide (3.72%), Ethanamine N-ethyl-N-nitro (3.24%), 2-Furancarboxaldehyde 5-(hydroxymethyl)- (2.83%) and Phytol (2.60%) were found as the major compounds in the ethanol extract of *C. zeylanicum* whole plant. The nature of phytocompounds and their bioactivities are present in Table 10. The mass spectra of some of the detected compounds of *C. zeylanicum* are presented in Figures 7 and 8.

**LC-MS analysis**

Twenty one compounds were detected from the ethanol extract of the selected plant using LC-MS analysis. The LC-MS chromatogram and the mass spectrum of detected compounds are presented in Figures 9 and 10. The name of the detected compounds and their molecular mass are given in Table 11.

**Identification and Structure elucidation of the phytochemical constituents of the whole plant extract *C. zeylanicum***

**Isolated Compound 1**

i. **Identification of functional groups by IR spectral studies**

The IR spectrum of the isolated compound 1 from *C. zeylanicum* showed broad shattered peaks at 3462 cm\(^{-1}\) and 1050 cm\(^{-1}\) showing the (C-O) linkage. Four stretched peaks at 460.27 cm\(^{-1}\), 586.29 cm\(^{-1}\), 668.43 cm\(^{-1}\) and 794.50 cm\(^{-1}\) represent 4 methyl groups (CH\(_3\)), a staggered peak at 1600 cm\(^{-1}\) indicates the presence of hydroxyl groups (OH). The spectrum is depicted in the Figure 11.

ii. **Identification of active constituent by Mass spectrum**

The mass spectrum showed ion peak at m/z 139 and other fragments at 104, 96 and 66. The mass spectrum of the compound is shown in Figure 12.
iii. Structure elucidation of active constituent by $^1$H NMR and $^{13}$C NMR spectral studies

The $^1$H NMR showed multiplets between $\delta$ 6.88 and $\delta$ 9.18 representing aromatic stretching of 20 carbons. Two singlets and a doublet at $\delta$ 2.0776, $\delta$ 3.3658 and $\delta$ 2.4972 respectively indicates the presence of methyl group (CH$_3$).

The $^{13}$C NMR showed multiplets from $\delta$ 38.97 to $\delta$ 40.215 representing four methyl groups. Singlets at $\delta$ 29.33 and $\delta$ 40.64 show the presence of aliphatic carbons. Multiplets from $\delta$ 77.48 to $\delta$ 78.75 and from $\delta$ 114.07 to $\delta$ 146.30 show the presence of 20 aromatic carbons. The $^1$H NMR and $^{13}$CNMR spectra are given in the Figures 13 and 14 respectively.

iv. Identification of active constituent by elemental analysis

The elemental analysis showed the presence of 78.21% of Carbon, 10.21% of Hydrogen and 11.58% of Oxygen (Figure 15).

![Bar Chart](image)

**Figure 15.** Elemental analysis of isolated
The spectral and analytical data obtained in the present investigation confirmed that the molecular formula of the isolated compound 1 is \( \text{C}_{27}\text{H}_{42}\text{O}_3 \), its molecular weight is \( 414.62058 \) and the isolated compound 1 is Diosgenin. The structure of the compound 1 is given in Figure 16.

![Figure 16. Structure of the isolated compound 1](image)

Isolated Compound 2

i. Identification of functional groups by IR spectral studies

The IR spectrum of the isolated compound 2 from \( \text{C. zeylanicum} \) showed a broad spectrum and a broad stretch at \( 1095.67 \text{ cm}^{-1} \) and \( 3564.77 \text{ cm}^{-1} \) showing the presence of hydroxyl groups (OH). The spectrum also depicted a small stretched peak at \( 1622 \text{ cm}^{-1} \) representing the presence of carboxylic group (C=O) (Fig 17).

ii. Identification of active constituent by Mass spectrum

The mass spectrum of the isolated compound 2 showed a \( m+1/z \) peak at 139, showing the molecular weight of the compound to be 139 and the fragmentation peaks at 104, 96 and 66 (Figure 18).

iii. Structure elucidation of active constituent by \( ^1\text{H NMR} \) and \( ^{13}\text{C NMR} \) spectral studies
The \(^1\)H NMR spectrum of the isolated compound 2 from *C. zeylanicum* showed a singlet at \(\delta 5.763\) representing the presence of aromatic benzene ring. A triplet from \(\delta 1.821\) to \(\delta 1.921\) indicates the presence of three (C=C) groups. A doublet from \(\delta 5.023\) to \(\delta 5.223\) indicates the presence of two hydroxyl groups and a singlet at \(\delta 1.235\) represents the carboxylic group (C=O).

\(^{13}\)C NMR spectrum of the compound showed a peak at \(\delta 71.012\) representing the C7 carboxylic group (C=O). The peaks from \(\delta 78.103 – \delta 136.212\) represent the carbon C1 – C6 of the aromatic benzene ring (Figures 19 and 20).

**iv. Identification of active constituent by elemental analysis**

The elemental analysis showed the presence of 60.87\% of Carbon, 4.38\% of Hydrogen and 34.75 \% of Oxygen (Figure 21).

![Figure 21. Elemental analysis of isolated compound 2](image)
The above spectral and analytical data of the isolated compound 2, confirmed molecular formula is $C_7H_6O_3$, its weight is 138.12074 and the isolated compound 2 is para hydroxybenzoic acid. The structure of the isolated compound 2 is given in Figure 22.

![Structure of the isolated compound 2](image)

**Figure 22. Structure of the isolated compound 2**

**Pharmacological studies**

**Antioxidant Activity - DPPH radical scavenging activity**

DPPH radical scavenging activity of petroleum ether, benzene, ethyl acetate, methanol and ethanol extracts of the whole plant of *C. zeylanicum* is shown in Figure 23. The scavenging effect increases with the increase in the concentration of the extracts and also the standard. Among the solvents tested, ethanol extract exhibited the highest DPPH radical scavenging activity. At 800 µg/ml concentration, ethanol extract of *C. zeylanicum* possessed 118.51% DPPH scavenging activity.
Hydroxyl radical scavenging activity

Hydroxyl radical scavenging activity of petroleum ether, benzene, ethyl acetate, methanol and ethanol extracts of the whole plant of *C. zeylanicum* is shown in Figure 24. Ethyl acetate extract showed a very potent activity. At 800 µg/ml concentration, *C. zeylanicum* possessed 83.14% hydroxyl radical scavenging activity.
Superoxide radical scavenging activity

All the extracts of the whole plant of *C. zeylanicum* were subjected to be superoxide scavenging assay and the results are shown in Figure 25. The results showed that the benzene extract of *C. zeylanicum* whole plant (800 µg/ml) exhibited the maximum superoxide scavenging activity (93.61%). This scavenging activity was higher than that of the standard (ascorbic acid) which had 74.91% µg/ml scavenging activity.

![Figure 25. Superoxide radical scavenging activity of different solvent extracts of the whole plant of *C. zeylanicum*](image)

ABTS radical cation scavenging activity

The extracts of the whole plant of *C. zeylanicum* were subjected to be ABTS radical cation scavenging activity and the results are shown in Figure 26. The methanol extract exhibited potent ABTS radical cation scavenging activity in concentration dependent manner. At 800 µg/ml concentration, *C. zeylanicum* whole plant possessed 84.63% ABTS scavenging activity which was higher than that of the standard trolox (74.39%).
Reducing power

Figure 27 showed the reducing abilities of different solvent extracts of the whole plant of *C. zeylanicum* and was compared to the standard ascorbic acid. Absorbance of the solution was increased with the concentration. A higher absorbance indicated a higher reducing power. Among the solvents tested, methanol extract exhibited higher reducing activity.

Figure 26. ABTS radical cation scavenging activity of different solvent extracts of whole plant of *C. zeylanicum*
IC\textsubscript{50} value

IC\textsubscript{50} values of petroleum ether extract of \textit{C. zeylanicum} whole plant and standard ascorbic acid for DPPH, hydroxyl, superoxide radical scavenging activities and trolox for ABTS radical cation scavenging activity were found to be 17.93 µg/ml and 20.19 µg/ml; 15.63 µg/ml and 20.22 µg/ml; 26.11 µg/ml and 23.88 µg/ml and 14.39 µg/ml and 21.63 µg/ml respectively. IC\textsubscript{50} values of benzene extract of \textit{C. zeylanicum} whole plant and standard ascorbic acid for DPPH, hydroxyl, superoxide radical scavenging activities and trolox for ABTS radical cation scavenging activity were found to be 18.32 µg/ml and 20.19 µg/ml; 15.09 µg/ml and 20.22 µg/ml; 30.64 µg/ml and 23.88 µg/ml and 16.28 µg/ml and 21.63 µg/ml respectively. IC\textsubscript{50} values of ethyl acetate extract of \textit{C. zeylanicum} whole plant and standard ascorbic acid for DPPH, hydroxyl, superoxide radical scavenging activities and trolox for ABTS radical cation scavenging activity were found to be 20.56 µg/ml and 20.19 µg/ml; 22.53 µg/ml and 20.22 µg/ml; 24.89 µg/ml and 23.88 µg/ml and 21.63 µg/ml respectively.
20.22 µg/ml and 21.63 µg/ml respectively. IC_{50} values of methanol extract of *C. zeylanicum* whole plant and standard ascorbic acid for DPPH, hydroxyl, superoxide radical scavenging activities and trolox for ABTS radical cation scavenging activity were found to be 28.33 µg/ml and 20.19 µg/ml; 18.55 µg/ml and 20.22 µg/ml; 25.08 µg/ml and 23.88 µg/ml and 26.89 µg/ml and 21.63 µg/ml respectively. IC_{50} values of ethanol extract of *C. zeylanicum* whole plant and standard ascorbic acid for DPPH, hydroxyl, superoxide radical scavenging activities and trolox for ABTS radical cation scavenging activity were found to be 29.56 µg/ml and 20.19 µg/ml; 14.34 µg/ml and 20.22 µg/ml; 27.69 µg/ml and 23.88 µg/ml and 21.63 µg/ml and 21.63 µg/ml respectively (Table 12).

**Anticancer activity**

Antitumor activity of ethanol extract of the whole plant of *C. zeylanicum* against DAL tumor bearing mice was assessed by the parameters such as relative organ weights, solid tumor volume, viable and non-viable cell count, mean survival time and % increase of life span. The results are shown in tables (Table 13 - 15). The solid tumour volume, viable cell count, relative body weight and relative weight of organs such as spleen, thymus, liver, kidney and lungs were increased significantly in tumour induced control. In contrary, the mean survival time and non-viable cell count were decreased in DAL control animals (Group II). Administration of ethanol extracts of *C. zeylanicum* at the dose of 100 mg and 150 mg/kg body weight, significantly (*p*<0.01) decreased the tumor volume and viable cell count. Non-viable cell count was significantly (*p*<0.05) higher in *C. zeylanicum* treated animals when compared with tumour induced (DAL) control animals. The mean survival time was increased to 29.15±0.63 (% ILS = 57.99), 36.22±0.24 (% ILS = 96.31) and
34.65±0.74 (% ILS = 87.30) with the administration of ethanol extracts of *C. zeylanicum* at the dose of 100 mg and 150 mg/kg body weight and vincristine respectively.

Haematological parameters such as Hb, RBC, WBC etc., of tumor bearing mice (Group II), on day 14, were found to be significantly altered (Table 16) when compared to normal control group (Group I). The total WBC count was found to be increased with a reduction of Hb content of RBC. The total number of RBC showed a modest change. In differential count of WBC, the per cent of neutrophils was increased while the lymphocyte and eosinophil counts decreased. The administration with *C. zeylanicum* whole plant extract helped to recover these altered parameters towards near normal.

**Antidiabetic activity**

The blood glucose concentration of the normal control and *C. zeylanicum* whole plant extract treated animals (100 and 150 mg/kg body weight), estimated at 0, 30, 60, 90 and 120 min respectively, are shown in Table 17. Plant drug treatment, at the dose of 100 mg/kg and 150 mg/kg body weight, suppressed the rise in the level of glucose in the blood. Glibenclamide (600 mg/kg), a standard antidiabetic drug, also decreased the glucose level in blood (Table 17).

The blood samples were analyzed for glucose level at 0, 30, 60, 90, 120 min in normal control (Group I), diabetic control (Group II) and plant drug treated (Groups III and IV) and glibenclamide treated animals (Group V), by oral glucose tolerance test. When compared to diabetic control, the plant drug treated animals (Groups III and IV) showed a significant dose dependent decrease in the level of blood glucose, after 90 min and 120 min of treatment. The blood glucose decreasing
effect of plant extracts was comparable to the effect of glibenclamide, the standard antidiabetic drug (Table 18).

The impact of repeated oral administration of whole plant extract of *C. zeylanicum* and glibenclamide, on normal and diabetic rats, was shown in Table 19. The fasting blood glucose (FBG) level remains practically the same before and after the treatment with vehicle (saline only) in case of normal control rats. Whereas, in diabetic control rats fasting blood glucose level rises gradually for 2 weeks after treatment with vehicle (saline only). Moreover, treatment with the most effective dose of *C. zeylanicum* whole plant extract (150 mg/kg body weight), after 2 weeks, FBG decreases significantly from 209.16 mg/dl to 104.33 mg/dl. This sharp fall of fasting blood glucose level was a clear evidence of significant antidiabetic effect of *C. zeylanicum* whole plant extract.

Table 20 shows the levels of blood glucose, plasma insulin, urea, creatinine and glycosylated haemoglobin of normal and experimental rats. When compared to normal control (Group I), the alloxan induced diabetic control rats (Group II) showed a significant elevation in levels of blood glucose, urea, creatinine and glycosylated haemoglobin, but there was a decrease in the level of plasma insulin. Administration with the whole plant ethanol extract of *C. zeylanicum*, at 100 mg/kg and 150 mg/kg body weight dose (Group III & IV), and glibenclamide (Group V) tends to bring the parameters significantly towards normal. The effect of whole plant extract, at the dose of 150 mg/kg body weight, was highly significant in restoring normalcy.

The levels of total protein, albumin, globulin, and liver marker enzymes such as SGPT, SGOT and ALP in the serum of diabetic rats are presented in the Table 21.
When compared with normal control rats (Group I), the diabetic control rats (Group II) had decreased levels of serum total protein, albumin, globulin and elevated levels of liver marker enzymes such as SGPT, SGOT and ALP. After treatment with, the whole plant ethanol extract of *C. zeylanicum* at 100 and 150 mg/kg body weight doses (Groups III and IV) and glibenclamide (Group V), the total protein, albumin, globulin, and liver marker enzymes were brought back to near normal levels.

Table 22 shows the levels of TC, TG, HDL–C, LDL-C, VLDL-C, PL and LDL / HDL in the serum of diabetic rats. The diabetic rats had elevated levels of serum TC, TG, LDL-C, VLDL-C and PL and decreased level of HDL-C as compared with normal control rats. Diabetic rats treated with whole plant extract of *C. zeylanicum* and glibenclamide reversed serum lipid profiles to near normal levels.

The activities of LPO, GPx, GSH, SOD and CAT in the serum, liver and kidney of alloxan induced diabetic rats are illustrated in Table 23. In the present study, the alloxan induced diabetic rats had shown increased activities of LPO, and decreased activities of SOD, CAT and GPx in the serum, liver and kidney. Treatment with *C. zeylanicum* and glibenclamide showed reversal of all these parameters to near normal levels.

**Hepatoprotective activity**

The effect of ethanol extract of *C. zeylanicum* on body weight of the normal control, CCl₄ intoxicated control and drug treated rat groups are shown in Table 24. An increase in body weight was noticed in Group I (normal control), Group VI (silymarin treated group) and Group V (plant drug at 150 mg/kg body weight treated group). Whereas a loss in body weight was noticed in CCl₄ intoxicated control rats (Group II) and plant drug at the dose of 50 mg/kg and 100 mg/kg body weight treated rats (Groups III and IV). The body weight loss was higher in liver damaged control
rats (11.6%) than in plant drug treated liver damaged rats (Groups III and IV). Table 25 shows the effect of ethanol extract of *C. zeylanicum* on serum total protein, albumin, globulin, A/G ratio, serum transaminases, alkaline phosphatases in CCl₄ intoxicated rats. There was a significant (*p* < 0.01) increase in serum GOT, GPT and ALP levels in CCl₄ intoxicated group (Group II) when compared to the normal control group (Group I). The total protein level was significantly (*p* < 0.01) decreased from 8.12 g/dl in normal control to 6.88 g/dl in CCl₄ intoxicated control. Ethanol extract of *C. zeylanicum*, at a dose of 50 mg/kg orally, decreased the elevated serum marker enzymes significantly. Treatments with standard drug silymarin and plant extract reversed the altered total protein and albumin to almost normal level.

The effect of ethanol extract of *C. zeylanicum* on total, conjugated and unconjugated bilirubin and γ-glutamyl transferase is shown in Table 26. There was a significant elevation of total, conjugated, unconjugated bilirubin and γ-glutamyl transferase in the serum of CCl₄ intoxicated group (Group II) when compared to normal control (Group I). The whole plant ethanol extract of *C. zeylanicum*, at a dose of 50 mg/kg, reduced the levels of total, conjugated and unconjugated bilirubin (Group III). The decrease in the concentration of total bilirubin, conjugated bilirubin, unconjugated bilirubin and γ-glutamyl transferase were found to be greater in silymarin, the standard drug treated rats (Group VI) followed by Group III, Group IV and Group V rats treated with the plant extract.

The effect of ethanol extract of *C. zeylanicum* on lipid peroxidation (LPO), glutathione peroxidase (GPx), glutathione reductase (GRD), superoxide dismutase (SOD) catalase (CAT) and reduced glutathione (GSH) activities is shown in Table 27. When compared to the normal control rats (Group I), the level of lipid peroxidation increased significantly (*p*<0.01) and the levels of glutathione peroxidase, glutathione
reductase, superoxide dismutase and catalase decreased significantly \( (p<0.01) \) in 
CCl\(_4\) intoxicated control rats (Group II). Treatment with the ethanol extract of 
C. *zeylanicum*, at the dose of 50 mg/kg, decreased the elevated lipid peroxidation 
level significantly and restored the altered glutathione peroxidase, glutathione 
reductase, superoxide dismutase, catalase and reduced glutathione levels towards 
normal in a dose dependent manner. The results were well comparable with silymarin, 
the standard drug, treated rats.

**Antifertility activity**

**Body and reproductive organ weight**

The administration with whole plant ethanol extract of *C. zeylanicum* in rats 
did not cause any significant change in the body weight (Table 28) and on the libido 
of treated rats. Whereas, the weight of testis and other accessory sex organs decreased 
significantly \( (p<0.05) \). Among the accessory sex organs, a significant weight 
reduction was seen in the caput and caudal epididymal segment. Slight decrease was 
oberved in vas deferens (VD) seminal vesicle (SV) and prostrate.

**Sperm count and sperm motility**

Sperm motility and sperm density in caudal epididymis decreased significantly 
(Table 29). The reduction was very severe in rats treated with whole plant extract of 
*C. zeylanicum* at the dose of 150 mg/kg body weight (Group IV) followed by 
Group III and Group II rats treated with plant extract at the dose of 100 mg/kg and 
50 mg/kg body weight respectively. The same trend was seen in the caput epididymal 
sperm density when compared to control rats (Group I).

**Sperm abnormality**

Treatment with the whole plant ethanol extract of *C. zeylanicum* drastically 
caused \( (p< 0.05) \) sperm abnormality in caput and caudal regions (Table 29). Among
the different concentrations of plant extract studied, concentration at 150 mg/kg body weight showed a significant and drastic abnormality in the sperm morphology. Further, in all the treated groups, tail region of the sperm was much more affected than the head region.

**Serum biochemical profile**

Serum protein, albumin, globulin, urea and creatinine and the activity of liver marker enzymes (SGOT, SGPT and ALP) of the control and treated rats are depicted in Table 30. The results showed no significant changes in the serum protein, albumin and globulin. Though the level of creatinine slightly increased in rats treated with the plant extract at 50 mg/kg and 100 mg/kg body weight, 150 mg/kg body weight dose did not cause much change in the level of creatinine. The level of urea and liver marker enzymes like SGOT, SGPT and ALP increased, in a dose dependent manner, in all the plant drug treated groups, when compared to the control group.

**Reproductive hormone profile**

**Serum testosterone level**

The repeated treatment with the ethanol extract of the whole plant of *C. zeylanicum*, daily for 14 days, caused a significant and dose dependent decrease in the serum level of testosterone in male rats (Table 31).

**Serum luteinizing hormone (LH) level**

Repeated treatment of the male rats with the *C. zeylanicum* extract for 14 days caused a dose related decrease in the serum level of LH (Table 31). This decrease in the level of serum luteinizing hormone (LH) was statistically significant (*p* < 0.05) in rats treated with the plant extract at the dose of 150 mg/kg (Group IV).
**Serum estrogen level**

Administration of male rats for 14 days with the ethanol extract of *C. zeylanicum*, at 150 mg/kg body weight dose, caused a sharp rise in the serum level of estrogen (Table 31).

**Serum follicle stimulating hormone (FSH) level**

Pretreatment with the whole plant ethanol extract of *C. zeylanicum*, for 14 days, caused a statistically significant (*p*<0.05) increase in the serum level of FSH in male rats when compared to the control rats (Table 31).

**Fertility test**

The results presented in Table 32 showed that intragastric administration of the extract of the whole plant of *C. zeylanicum* (150 mg/kg body weight), for 14 days to male rats, caused a significant (*p*<0.05) decrease in the number of females impregnated by treated male rats. When compared to females impregnated with untreated male rats, the number of viable foetuses formed decreased significantly (*p*< 0.05) in female rats impregnated by treated males. Similarly, the number of resorption sites was found to be reduced in female rats impregnated by treated male rats when compared to controls.

**Antiinflammatory activity**

Table 33 shows that the antiinflammatory activities of the whole plant ethanol extract of *C. zeylanicum*. The plant extract inhibited the paw oedema, induced by carrageenan, in rats significantly. The inhibition was dose dependent and the percentage of inhibition at 3rd h of induction of paw oedema was 66.81, 74.72 and 80.53 for 50 mg/kg, 100 mg/kg and 150 mg/kg body weight respectively.