

LIST OF FIGURES

- Figure 1:** Demand and supply gap of different indigenous medicinal plant in Gujarat state
- Figure 2:** *Hemidesmus indicus* plant
- Figure 3:** Chemical structure of lupeol
- Figure 4:** Biosynthetic pathway of lupeol
- Figure 5:** Chemical structure of rutin
- Figure 6:** Biosynthetic pathway of rutin
- Figure 7:** Effect of BA and Kn on callus induction from leaf explant of *H. indicus* after eight weeks
- Figure 8:** Effect of individual cytokinins on leaf explant after eight weeks
- Figure 9:** Effect of IAA, NAA and 2,4-D on callus induction from leaf explant of *H. indicus* after eight weeks
- Figure 10:** Effect of individual auxins and combinations of cytokinins on leaf explant after eight weeks
- Figure 11:** Effect of BA and Kn on callus induction from leaf explant of *H. indicus* after eight weeks
- Figure 12:** Indirect shoot regeneration from leaf explant in MS medium fortified with sucrose (3%), BA (20 μ M) and IAA (1 μ M)
- Figure 13:** Shoot regeneration from leaf explant of *H. indicus* in different concentrations of BA (20 and 25 μ M) with IAA (0.1-2 μ M) after eight weeks
- Figure 14:** Synergistic effect of cytokinins with auxins on leaf explant after eight weeks
- Figure 15:** Effect of BA and NAA on callus induction from leaf explant of *H. indicus* after eight weeks.
- Figure 16:** Effect of Kn and IAA on callus induction from leaf explant of *H. indicus* after eight weeks.
- Figure 17:** Effect of Kn and NAA on callus induction from leaf explant of *H. indicus* after eight weeks.
- Figure 18:** Effect of individual cytokinin or auxin on shoot regeneration from nodal explant of *H. indicus* after eight weeks
- Figure 19:** Shoot regeneration from nodal explants in optimized MS medium [BA (10 μ M) and Kn (5 μ M)]

Figure 20: Effect of synergism of cytokinins on shoot regeneration from nodal explant after eight weeks

Figure 21: Effect of combination of cytokinin and auxin on shoot regeneration from nodal explant after eight weeks

Figure 22: Shoot regeneration from *in vitro* nodes in medium MS + sucrose (3%) + BA (10 μ M) + Kn (5 μ M)

Figure 23: Rooting of shoots after four weeks

Figure 24: HPTLC fingerprint of hexane extracts

Figure 25: HPTLC fingerprint of ethyl acetate extracts

Figure 26: HPTLC fingerprint of methanol extracts

Figure 27: Standard curve of lupeol

Figure 28: Quantification of lupeol in shoot cultures

Figure 29: Shoot cultures in liquid medium fortified with BA (10 μ M) and Kn (5 μ M)

Figure 30: Lupeol quantification in liquid shoot cultures

Figure 31: FW-DW of shoots from control medium

Figure 32: Elicitation of shoots in medium fortified with different concentrations of YE

Figure 33: FW-DW of shoots from YE treated samples

Figure 34: TLC plates and respective chromatograms of hexane extracts of shoots treated with different concentrations of YE

Figure 35: Elicitation of shoots in medium fortified with different concentrations of SA

Figure 36: FW-DW of shoots from SA treated samples

Figure 37: TLC plates and respective chromatograms of hexane extracts of shoots treated with different concentrations of SA

Figure 38: Standard curve of rutin

Figure 39: TLC plates of ethanol extract at 254 nm

Figure 40: Spectral analysis of all samples for rutin identification at 254 nm

Figure 41: Mass spectra of samples of ethanolic extract

Figure 42: Qualitative analysis for kaempferol in *in vivo* and *in vitro* shoots at 366 nm

Figure 43: Multiple sequence alignment of *F3'5'H* using CLUSTALW analysis for G1P1 primer

Figure 44: Multiple sequence alignment of *F3'5'H* using CLUSTALW analysis for G1P2 primer

Figure 45: Multiple sequence alignment of *F3'H* using CLUSTALW analysis for G2P1 and G2P2 primers

Figure 46: Isolated RNA from shoots of different samples

Figure 47: cDNA amplification