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# Identification and quantification of biological active constituents of *Amritarishta*, a herbal formulation

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Herbal formulations have been used by Indian and Chinese traditional systems of medication for a long time. *Amritarishta* is one of the herbal formulations that possess various biological activity viz., antioxidant, anticancer, analgesic, antipyretic, antidiabetic, etc. The active constituents include gallic acid, tannic acid, piperine, and quercetin, etc. Ethanolic extract of the formulation was analysed and quantified. $R_f$ (Retardation factor), functional groups and amount of some of the major chemical constituents were analysed by TLC, FTIR, LC/MS, HPTLC and HPLC, respectively. LC/MS results reveal the presence of quercetin, piperine, tannic acid and gallic acid in the formulation. With the help of HPTLC and HPLC, the quantity of 4 chemical constituents in the formulation was estimated. This type of study is completely new to herbal research.

## Supplementary Data:

Table S1 — List of ingredients in *Amritarishta*

| S no | Name | Botanical name | Part (AFI) | Quantity |
|---|---|---|---|---|
| 1 | Amrta (guduci) | *Tinospora cordifolia* (Wild.) Miers. | St. | 4.800 kg |
| 2 | Bilva | *Aegle marmelos* Corr. | Rt./St. Bk. | 480 g |
| 3 | Syonaka | *Oroxylum indicum* Vent. | Rt./St. Bk | 480 g |
| 4 | Gambhari | *Gmelina arborea* Linn. | Rt./St. Bk | 480 g |
| 5 | Patala | *Stereospermum suaveolens* DC. | Rt./St. Bk | 480 g |
| 6 | Agnimantha | *Premna mucronata* Roxb. | Rt./St. Bk | 480 g |
| 7 | Salaparni | *Desmodium gangeticum* DC. | Pl. | 480 g |
| 8 | Prsniparni | *Uraria picta* Desv. | Pl. | 480 g |
| 9 | Brhati | *Solanum melongena* Linn. var. indicum (L.) O. Kuntze | Pl. | 480 g |
| 10 | Kantakari | *Solanum surattense* Burm. f. | Pl. | 480 g |
| 11 | Goksura | *Tribulus terrestris* Linn. | Pl. | 480 g |
| 12 | Water for decoction | | - | 49.152 L |
| | Reduced to | | - | 12.288 L |
| 13 | Guda | - | - | 14.4 kg |

Prakshepa Dravya:

| S no | Name | Botanical name | Part (AFI) | Quantity |
|---|---|---|---|---|
| 14 | Ajaji (svetajiraka) | *Cuminum cyminum* Linn. | Fr. | 768 g |
| 15 | Raktapuspaka (parpata) | *Fumaria parviflora* Lam. | Pl. | 96 g |
| 16 | Saptacchada (saptaparna) | *Alstonia scholaris* R. Br. | St. Bk. | 48 g |
| 17 | Sunthi | *Zingiber officinale* Rosc. | Rz. | 48 g |
| 18 | Marica | *Piper nigrum* Linn. | Fr. | 48 g |
| 19 | Pippali | *Piper longum* Linn. | Fr. | 48 g |
| 20 | Nagakesara (kesara) | *Mesua ferrea* Linn. | Stmn. | 48 g |
| 21 | Abda(musta) | *Cyperus rotundus* Linn. | Rz. | 48 g |
| 22 | Katvi (katuka) | *Picrorrhriza kurroa* Royle ex. Benth. | Rz. | 48 g |
| 23 | Prativisa (ativisa) | *Aconitum heterophyllum* Wall. ex. Royle | Rt. | 48 g |
| 24 | Vatsabija (indrayava) | *Holarrhena antidysenterica* Wall. | Sd. | 48 g |

Table S2 — HPLC of gallic acid and tannic acid:

| **Standard** | **Λ max (nm)** | **Min.** | **Area** | **Average conc.(%w/v)** |
|---|---|---|---|---|
| Gallic acid | 273 | 4.40 | 813134 | 0.16 |
| Tannic acid | 278 | 13.00 | 579730 | 0.052 |

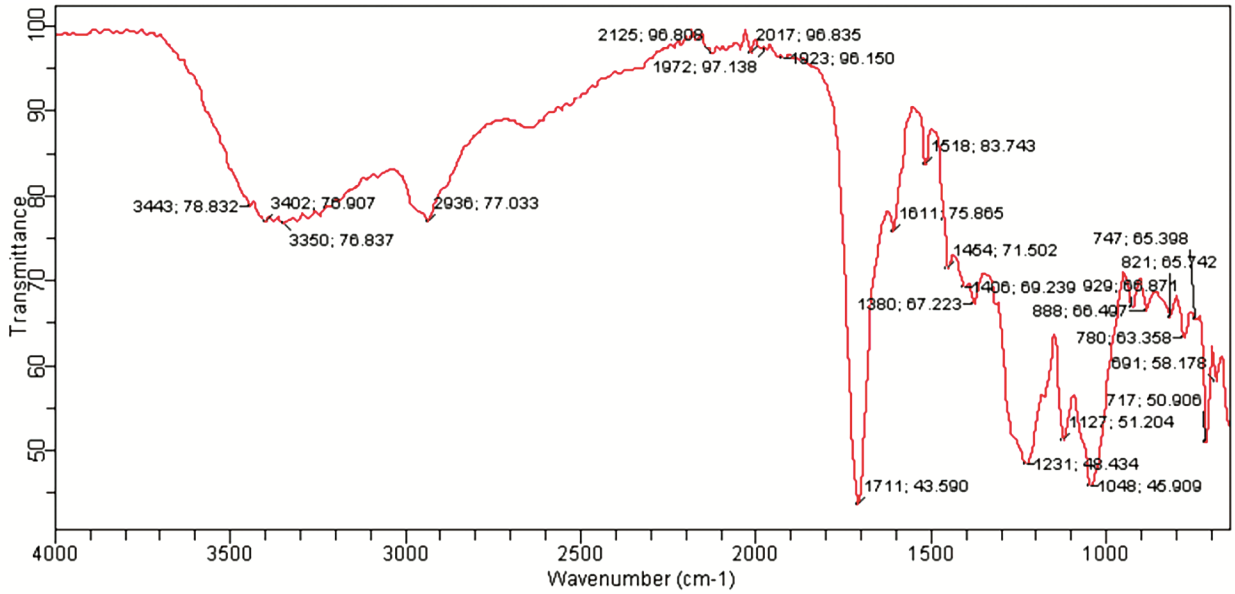


Fig. S1 — FTIR of *Amritarishta* formulation

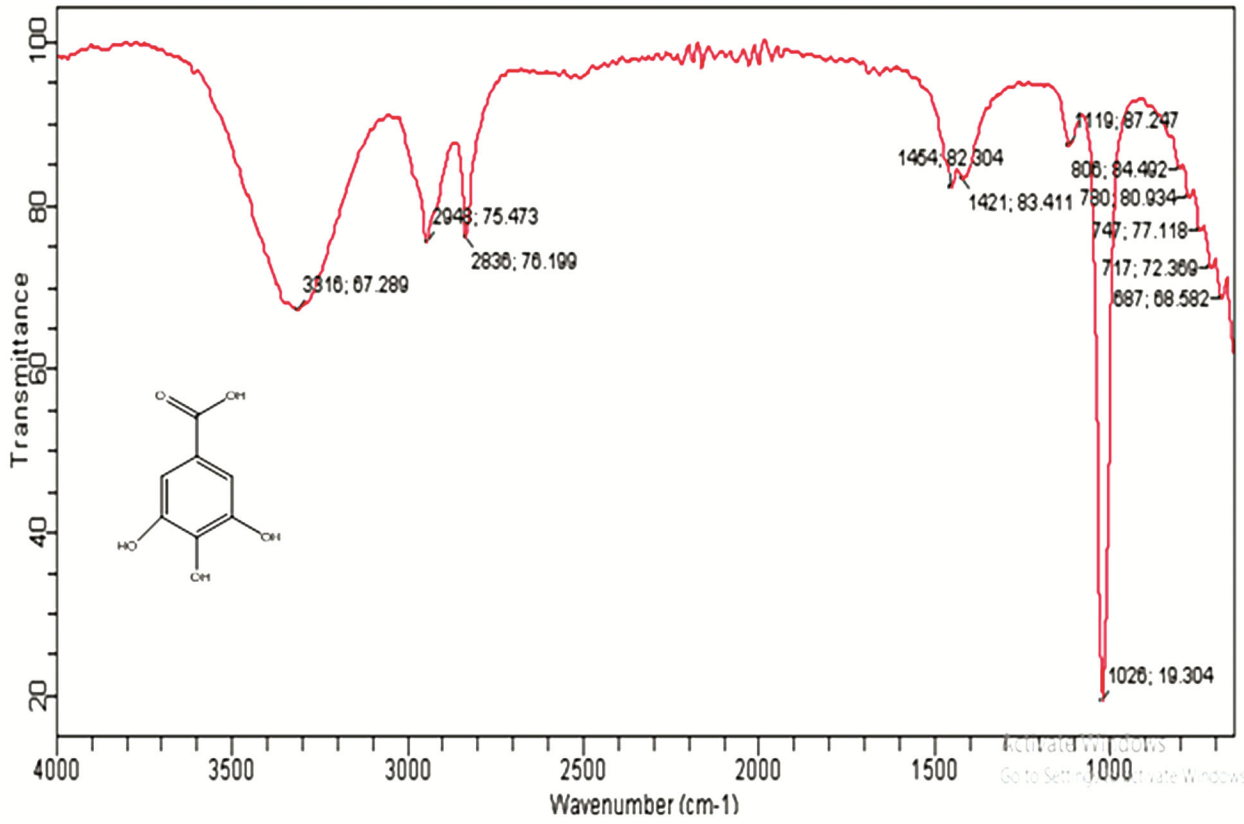


Fig. S2 — FTIR of standard gallic acid

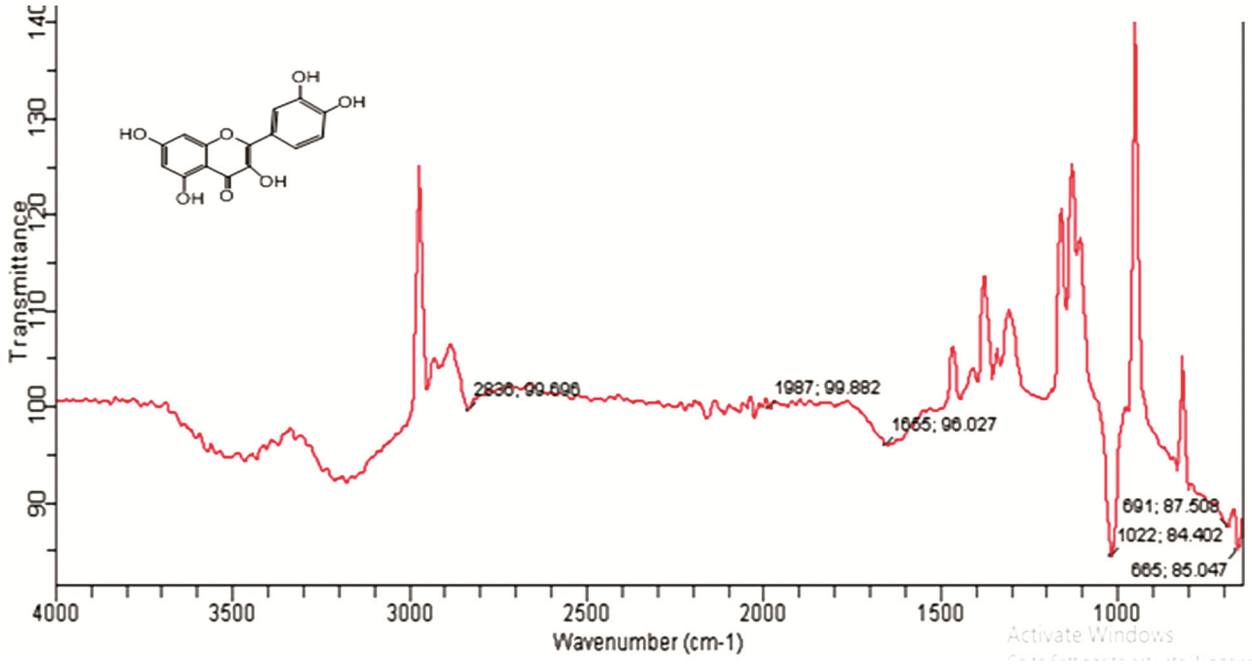


Fig. S3 — FTIR of standard quercetin

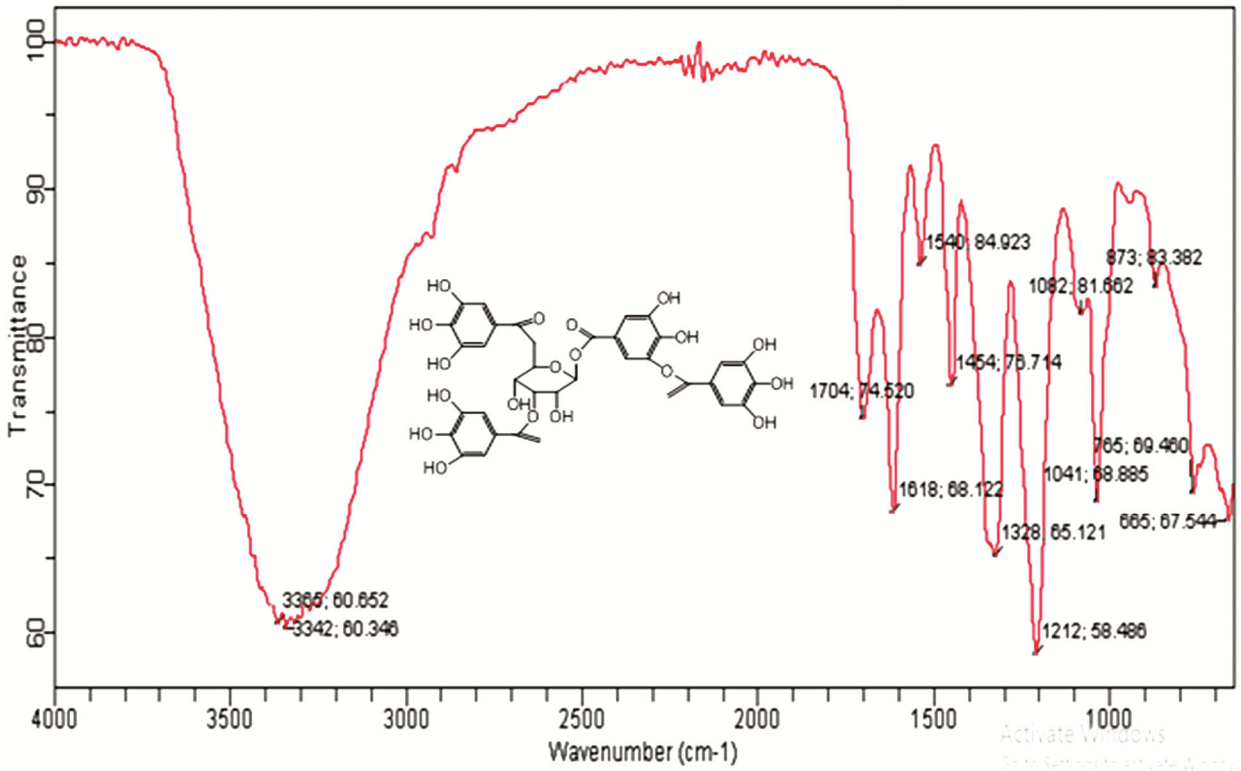


Fig. S4 — FTIR of standard tannic acid

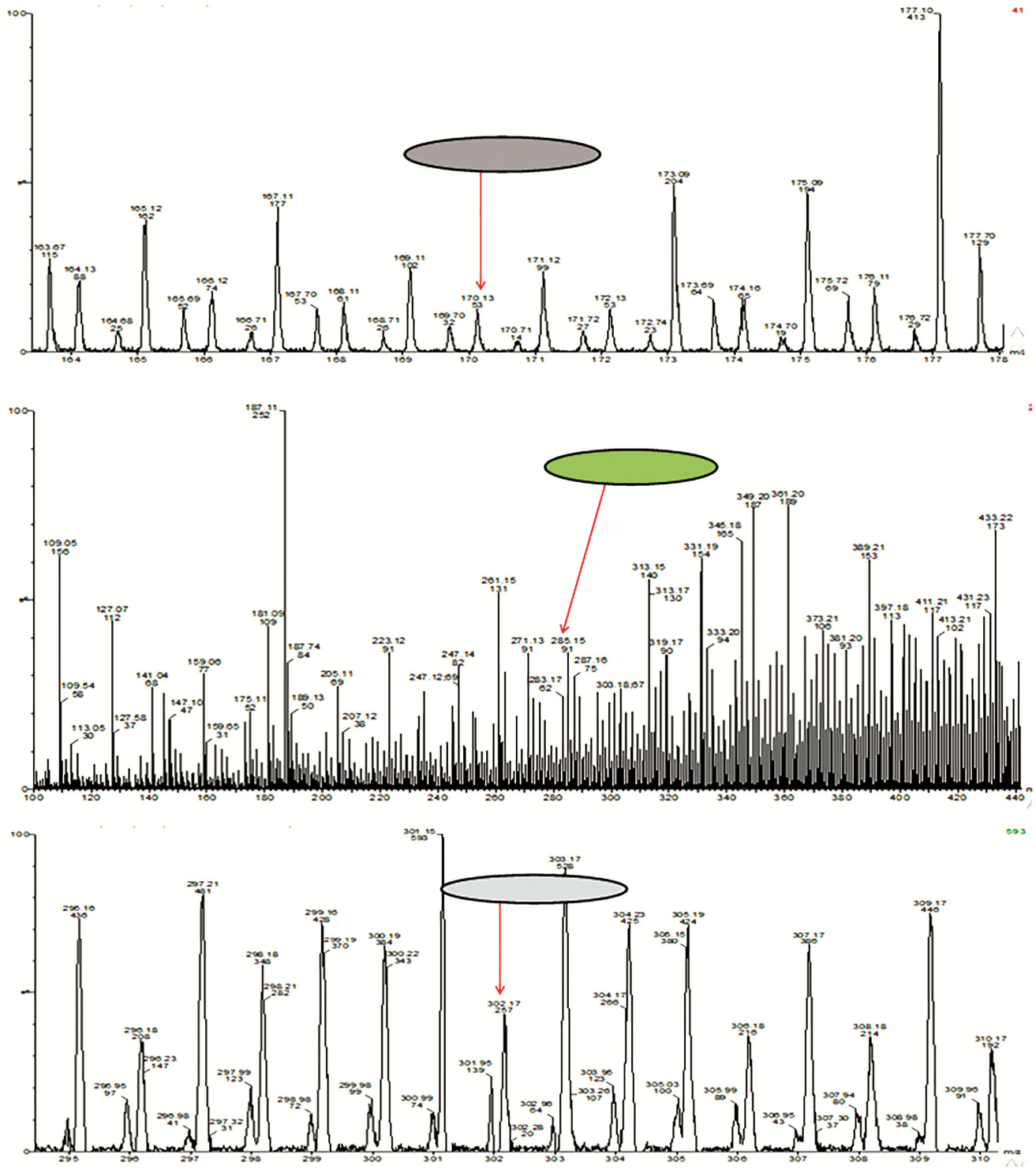

Fig. S5 — LC/MS spectra of the formulation & identification of Gallic acid, Piperine and Quercetin

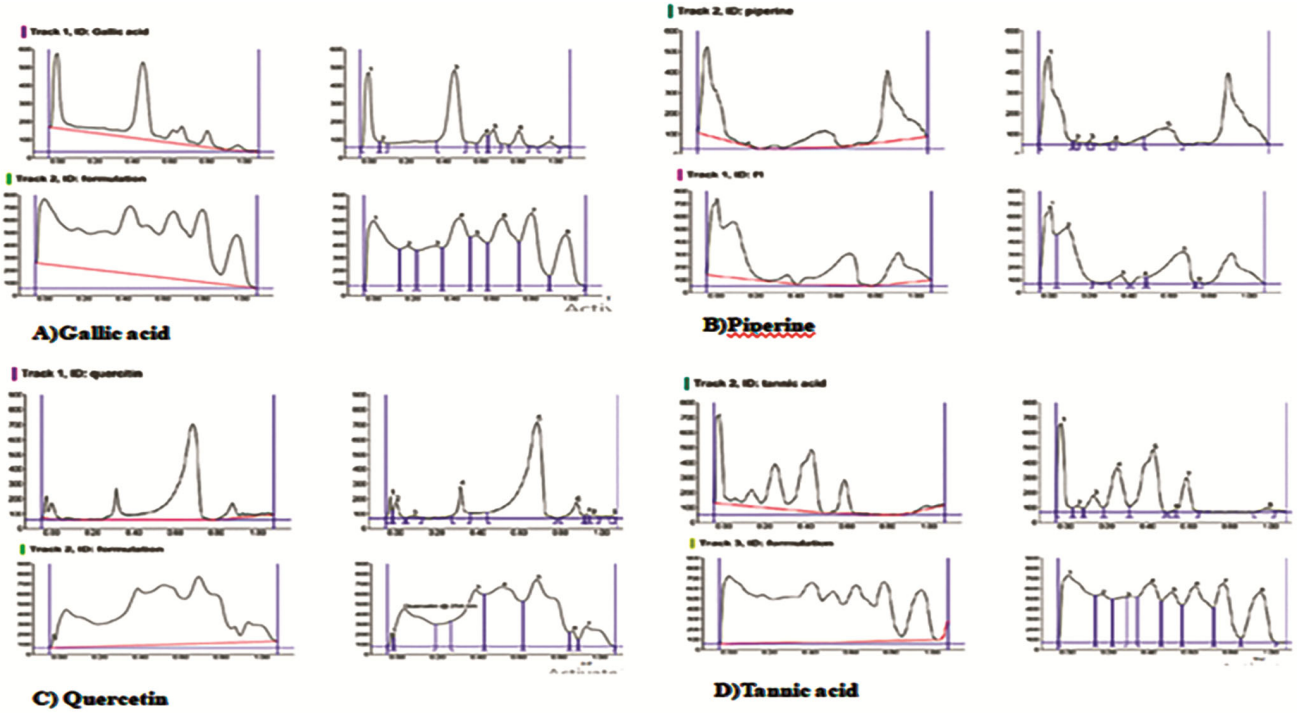


Fig. S6 — HPTLC chromatograms A) Quantification study of gallic acid in formulation B) Quantification study of piperine in formulation C) Quantification study of quercetin in formulation D) Quantification study of tannic acid in formulation

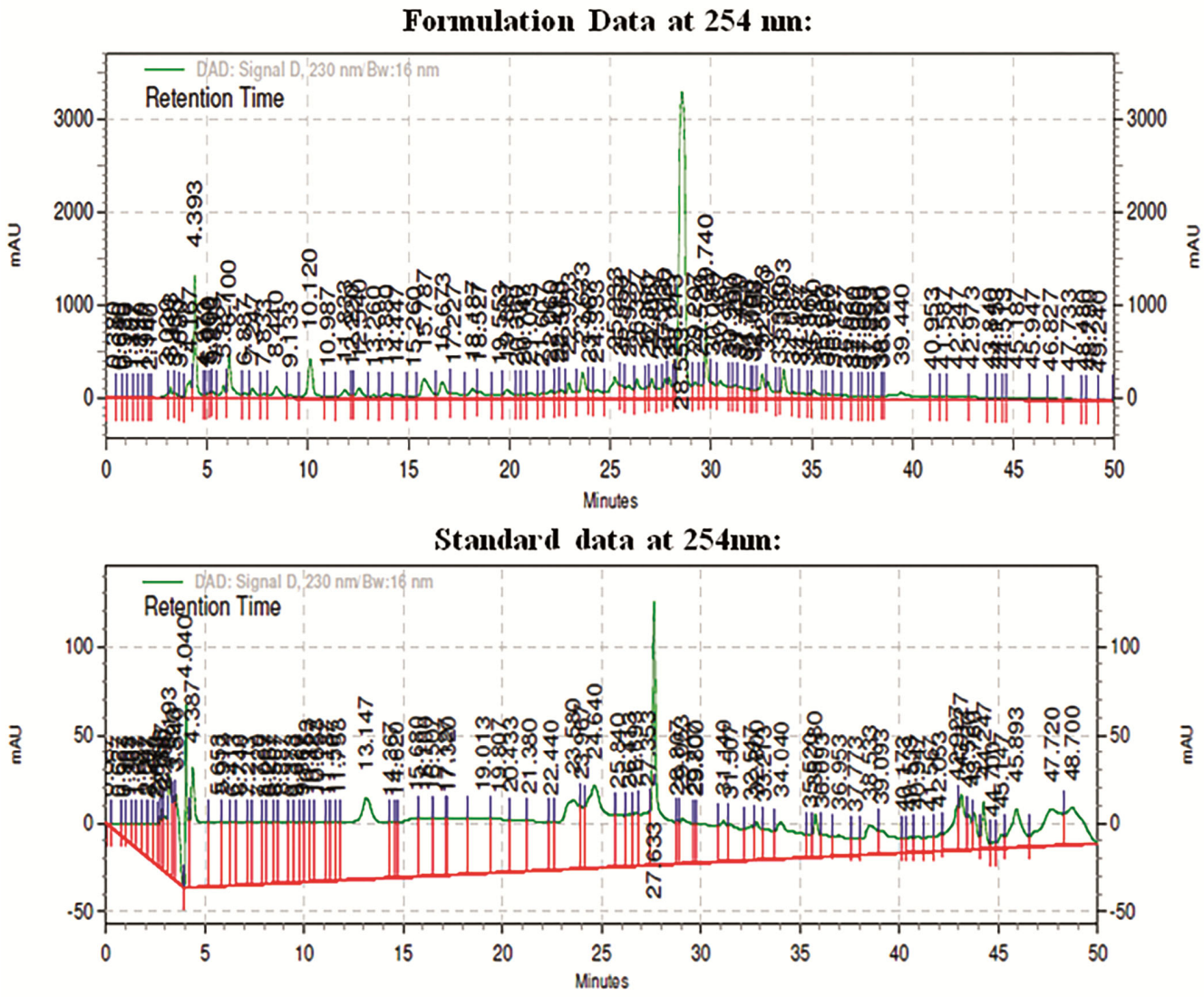


Fig. S7 — HPLC of formulation and standard