**Table 1**

Phytochemical screening of water and ethanol extract of *Senna alata* leaves.

|  |  |  |
| --- | --- | --- |
| **Phytochemical constituents** | **Specific tests** | **Result** |
| **Methanol extract** |
| Alkaloid | Mayer's test | - |
| Wagner test | - |
| Hager’s test | - |
| Dragendroff’s test | - |
| Carbohydrate | Molish's test | + |
| Benedict's test | + |
| Glycoside | Modified Borntrager test (Anthraquinones) | - |
| Killer killiani test (Cardiac glycoside)  | + |
| Saponin | Foam test | + |
| Phenol | Ferric chloride test | + |
| Flavonoid | Alkaline reagent test | + |
| Shinoda test | + |
| Zn-HCl test | + |
| Tannin | Gelatin test | + |
| Ferric Chloride test | + |
| Terpenoid | Salkowaski test | - |
| Copper acetate test | - |
| +: Presence, -: Absence |

**Table 2**

GC –MS analysis

|  |  |  |  |
| --- | --- | --- | --- |
| **S.N** | **Name of Compound** | **Molecular formula** | **Reported Activity** |
| 1 | 3-Methylmannoside | C7H14O6  | Plant growth regulator/ regulate plant growth by modulating glycoconjugation to lectins in plants  |
|
| 2 | Neophytadiene | C20H38  | Antimicrobial, additive for liquid cigarette  |
|
|
| 3 | Squalene | C30H50  | Antioxidant  |
| 4 | Campesterol | C28H48O | Anticancer, Antimicrobial , anti-inflammatory |
| 5 | Stigmasterol | C29H48O  | Anticancer, Antiinflammatory  |
|
| 6 | Alpha.Tocospiro | C29H50O4  | Cytotoxicity against human A549 cells by SRB assay. |
| Antimicrobacterial activity against Mycobacterium tuberculosis H37Rv  |
|   |

**Table 3**

Extraction yield (%) of three solvents of *Senna alata* leaves, total phenolic and flavonoids content.

|  |  |  |  |
| --- | --- | --- | --- |
| **Extract** | **Extraction yield (%)** | **Phenols (mg GAE/g dry extract weight)** | **Flavonoids (mg QE/g dry extract weight)** |
| Methanol extract | 5.92 | 46.36±4.5 | 480.4±3.055 |
| Hexane extract | 1.54 | 44.89±4.49 | 476.17±4.33 |
| Ethyl acetate | 0.78 | 40.66±0.36 | 435.77±4.81 |
| Values calculated from the mean of three times experiment and represented as mean ± S.D |

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**Table 4**

IC50 value and DPPH free radical scavenging activity of both *Senna alata* extracts at varying concentrations.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Extract/ Standard** |  | **% activity of DPPH scavenging** |  | **IC50 µg/mL** |
| **5 µg/mL** | **10 µg/mL** | **15 µg/mL** | **20 µg/mL** | **25 µg/mL** |
| Methanol extract | 15.13±0.0093 | 24.65±0.0063 | 29.28±0.0094 | 37.33±0.0290 | 42.83±0.0049 | 29.81 |
| Ascorbic acid | 41.19±0.0090 | 61.69±0.0012 | 75.59±0.0050 | 92.56±0.0050 | 97.07±0.0080 | 6.12 |
|  | Values calculated from the mean of three times experiment and represented as mean ± standard deviation (n=3). |

 **Fig. 1.** Antioxidant activity by using DPPH.

**Table 5**

Percentage clot lysis of extract.

|  |  |  |
| --- | --- | --- |
| **S.N**  | **Concentration(mg/ml)**  | **% clot lysis**  |
| Extract 1  |  10  |  7.89  |
| Extract 2  |  25  |  10.13  |
| Streptokinase  |  30,000 I.U  |  40.77  |
| Negative control  |  D/W  |  2.03  |
|  |  |  |

 **Fig. 2.** Thrombolytic activity of the extract.

**Table 6**

Percentage protection and percentage hemolysis of extract and standard.

|  |  |  |
| --- | --- | --- |
| Concentration(μg/ml) |  Percentage Protection  |  % hemolysis  |
| Diclofenac  | Extract  | Diclofenac  | Extract  |
| 10 | 19.21 | 4.5 | 80.79 | 95.46 |
| 20 | 21.62 | 7.4 | 78.38 | 92.75 |
| 40 | 24.32 | 10.32 | 75.68 | 89.62 |
| 80 | 29.81 | 18.16 | 70.19 | 77.90 |
| 100 | 36.51 | 23.32 | 63.49 | 75.17 |

**Fig. 3.** Anti-inflammatory activity of standard and extract.

**Table 7**

EC50 values for Diclofenac and extract.

|  |  |
| --- | --- |
| Name  | EC50  |
| Diclofenac sodium  | 8.54  |
| Extract  | 9.93  |

**Fig. 4.** Anti-inflammatory activity.

**Table 8**

Percentage mortality by standard Vincristine Sulphate

|  |  |  |
| --- | --- | --- |
| Concn (μg/ml) | % mortality  | LC50 value  |
| 0.25  | 20  | 7.32  |
| 0.5  | 30  |  |
| 1  | 30  |  |
| 5  | 40  |  |
| 10  | 60  |  |

 **Fig. 5.** Cytotoxic activity of vincristine Sulphate

**Table 9**

Percentage mortality of brine shrimp by extract.

|  |  |  |
| --- | --- | --- |
| Concentration (μg/ml) | % Mortality | LC50 (μg/ml) |
| 50 | 0 | 767.85 |
| 100 | 0 |  |
| 200 | 10 |  |
| 400 | 30 |  |
| 800 | 50 |  |

**Fig. 6.** Cytotoxic activity of extract

**Table 10** Antibacterial activity

|  |  |  |
| --- | --- | --- |
| **Sample** | **Concn (μg/ml)** |  **Inhibition zones of antibacterial screening (mm)** |
| *S. aureus* | *B. subtilis* | *K. pneumoniae* | *E. coli* |
|    Azithromycin | 40  |  5 | 10  | -  |  - |
| 80 |  7 |  12 |  - |  - |
| 160 |  12 |  19 |  - |  - |
| 320 |  14 |  21 |  - |  - |
|    Gentamycin | 40 |  - |  - |  3 |  8 |
| 80 |  - |  - |  3 |  9 |
| 160 |  - |  - |  4 |  13 |
| 320 |  - |  - |  7 |  15 |
|    Extract | 40 |  2 |  - |  - |  - |
| 80 |  3 |  1 |  - |  - |
| 160 |  4 |  2 |  1 |  - |
| 320 |  6 |  4 |  2 |  - |

**Fig. 7.** *Antibacterial activity**of extract against S.aureus*

**Fig. 7.** Antibacterial activityof extract against *B.subtilis.*

**Fig. 8.** Antibacterial activity of extract against *K .pneumoniae*.