RESEARCHERID
THOMSON REUTERS

[FRTSSDS- June 2018]
DOI: 10.5281/zenodo.1296218

ISSN 2348 – 8034
Impact Factor- 5.070

GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES

# PHYTOCHEMICAL INVESTIGATION AND GC-MS ANALYSIS OF ALCOHOLIC EXTRACT OF CYNODONDACTYLON

**Neha Sengar*[1], Dhananjay Dwivedi[2] &A.K. Gharia[2]**

[*1]Department of chemistry, Shri Umiya Kanya Mahavidyalaya, Rau, Indore (M.P.) India,
[2]P.M.B. Gujarati Science College, Indore, India

## ABSTRACT

Cynodondactylon is an important medicinal plant, belonging to the family Poaceae.The whole plant possesses various medicinal properties. The present work was carried out to investigate the phyto-constituents of ethanolic extract of cynodondactylon by GC-MS method. Total twelve compounds were identified from the ethanolic extract of aerial parts of cynodondactylon by GC-MS analysis.The results of preliminary phytochemical analysis revealed the presence of glycosides, flavonoids, saponins, phytosterols and terpenoids in the ethanolic extract of aerial parts of cynodondactylon.

***Key words:*** *cynodondactylon, phytochemical, GC-MS, ethanol extract.*

## I. INTRODUCTION

Cynodondactylon is a perennial grass, belong to family Poaceae[1]. It is commonly known as Bermuda grass, Durva or Doob in India. The plant is widely distributed throughout India[2], found almost everywhere in tropical, subtropical and even in semi-arid climates. Whole plant of Cynodondactylon possesses various medicinal properties. Cynodondactylon is traditionally used for dibetes, jaundice, urinary disease, kidney problem, abdominal pain, constipation, gastrointestinal disorder[3], to stop bleeding in piles and skin infections[4]. Previous studies reported that the aqueous extract of plant have anti-inflammatory, diuretic, anti-emetic and purifying properties[5, 6]. The ethanolic extract of plant reported to have C.N.S depressant and anti-oxidant activity[7]. In folk medicine, Cynodondactylon is used for calculus, carbuncles, cough, hypertension, snake bites, gout and rheumatic affections[8]. The juice of the plant is reported to have astringent property and can be applied externally to fresh cuts and wounds to stop bleeding. Whole plant of Cynodondactylon is used for diarrhea and dysentery[9].The plant is reported to contain crude proteins, carbohydrates, mineral constituents, beta sitosterol, flavonoids, alkaloids, glycosides and terpenoids. The aim of the present study is to investigate bioactive constituents of ethanolic extracts of Cynodondactylon by GC-MS analysis.

## II. MATERIAL AND METHODS

**Collection of plant material**

The aerial parts of Cynodondactylon were collected from in and around Umiyagirls college campus, rau Indore. The collected plant material was washed in running tap water, rinsed with distilled water and shade dried at room temperature for three days. The shade dried material was kept in hot air oven at $40^0$C for three hours to complete dryness. The dried plant material cut into small pieces and powdered in a mixer grinder.

**Preparation of extract**

250 gm dried powder of Cynodondactylon was defatted with 500 ml of petroleum ether for about 24 hours at room temperature. The extract was filtered with the help of whatman no. 1 filter paper and the residue was dried. The dried residue is used for extraction with 70 % ethanol by cool maceration technique. The extraction procedure was repeated three times to obtained complete extraction. The extract was filtered, evaporated to dryness. The dried extract was stored at low temperature until used.

ISSN 2348 – 8034
Impact Factor- 5.070

**Phytochemical analysis**

Ethanolic extract of Cynodondactylon was screened for the detection of alkaloids, glycosides, flavonoids, saponins, phenolic compounds and terpenoids by using standard methods of analysis[10, 11]. Results of the phytochemical analysis are show in table 1.

**Gas chromatography- Mass spectroscopic analysis (GC-MS)**

GC-MC analysis of ethanol extract of Cynodondactylon was carried out at Pinnacle biomedical research institute, Bhopal, Madhya Pradesh. The GC-MS analysis of the extract was performed using Agilent 7890A GC with 5975C MS (GC-MC) equipped with HP-5 column (Agilent J&W HP-5, 10 m × 0.32 mm, 0.25 µm (p/n 19091J-413) cut with 5 m retention gap). Composed of (5%-Phenyl)-methylpolysiloxane. For GC-MC Detection an electron ionization energy system with ionization energy of 70eV was used. Helium gas (99.999%) was used as the carrier gas at a constant flow rate of 1ml/min. and an injection volume of 2µl was employed (split ratio of 10:1). Injector temperature, Ion source temperature according to standard method of HP5 (General_1_HP5_80_DEG.M). Mass spectra were taken at 70eV; a scan interval of 0.4 sec. programmed at 80 °C (1 min), 2 °C/min to 140 °C (0 min), 7 °C/min to 335 °C (30 min). Total GC running time was 30min.

## III. RESULT AND DISCUSSION

The results of preliminary phytochemical analysis and GC-MS analysis are given in table 1 and table 2 respectively. The GC-MS chromatogram is shown in Figure 1.Total twelve compounds were identified from the ethanolic extract of aerial parts of cynodondactylon by GC-MS analysis. Interpretation of mass spectrum is done using the database of National Institute of Standard and Technology (NIST) having more than 62,000 patterns. Retention time, % peak area, molecular formula, molecular weight and name of identified compounds are given in table 2. The results of preliminary phytochemical analysis revealed the presence of glycosides, flavonoids, saponins, phytosterols and terpenoids in the ethanolic extract of aerial parts of cynodondactylon.

***Table 1: Phytochemical analysis of Cynodondactylon-***

| S.No. | Phytochemicals | Test performed | Ethanol extract |
|---|---|---|---|
| 1. | Alkaloids | Dragendroff's test | Absent |
| 2. | Glycosides | Borntrager's test | Present |
| 3. | Flavonoids | Lead acetate test | Present |
| 4. | Saponins | Froth test | Present |
| 5. | Tannins | Gelatin test | Absent |
| 6. | Phytosterols | Liebermann- Burchard's test | Present |
| 7. | Terpenoids | Chloroform test | Present |

***Table 2:GC-MS profile of C. dactylon***

| S.No. | Phyto-components | Molecular formula | Molecular weight | Retention time (min) | Peak area % |
|---|---|---|---|---|---|
| 1. | Benzaldehyde-3-(Chloroacetoxy)-4-methoxy | $C_{10}H_9ClO_4$ | 228 | 16.634 | 1.15 |
| 2. | Hexadecanoic acid, methyl ester | $C_{17}H_{34}O_2$ | 270 | 16.727 | 1.07 |
| 3. | 9,9-Dimethoxybicyclo [3.3.1] nona-2,4-dione | $C_{11}H_{16}O_4$ | 213 | 17.071 | 10.58 |
| 4. | n-Hexadecanoic acid | $C_{16}H_{32}O_2$ | 256 | 17.146 | 7.83 |
| 5. | Decanoic acid, ethyl ester | $C_{12}H_{24}O_2$ | 200 | 17.272 | 0.58 |
| 6. | Hexadecanoic acid, ethyl ester | $C_{18}H_{36}O_2$ | 284 | 17.339 | 1.68 |
| 7. | Octadecanoic acid, methyl ester | $C_{19}H_{38}O_2$ | 298 | 18.413 | 3.61 |
| 8. | 9,12-Octadecadienoic acid, ethyl ester | $C_{20}H_{36}O_2$ | 308 | 18.690 | 5.32 |
| 9. | 13-Docosenamide,(Z)- | $C_{22}H_{43}NO$ | 337 | 23.379 | 1.16 |

ISSN 2348 – 8034
Impact Factor- 5.070

| | | | | | |
|---|---|---|---|---|---|
| 10. | 9,12-Octadecadienoic acid (Z,Z)-,methyl ester | $C_{19}H_{34}O_2$ | 294 | 23.227 | 1.56 |
| 11. | Hexadecanal | $C_{16}H_{32}O$ | 240 | 23.127 | 1.18 |
| 12. | Apigenin-7-glucoside | $C_{21}H_{20}O_{10}$ | 432 | 28.597 | 28.09 |

**Sample ID**:EX-S1-CD-01
**Instrument:** **Agilent 7890A GC with 5975C MS system**

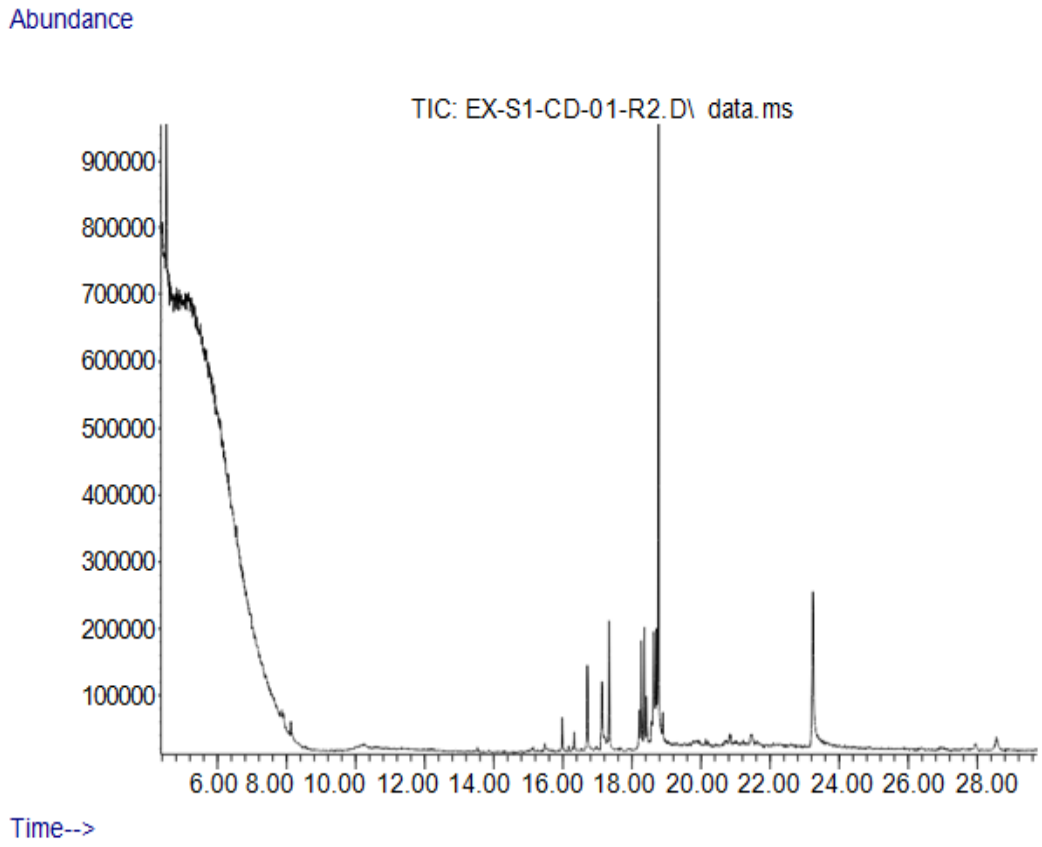


***Figure 1: GC-MS chromatogram of ethanolic extract of Cynodondactylon***

## REFERENCES

*[1]* Kasarkar, A. R., Thakur, M. S., Chougale, S. S., Wadkar, S. S., Jadhav, S. B., Patil, S. A., Kabul, S. B. Preliminary phytochemical investigation of the leaves of cynodondactylon (L.) Pers., Cyperusrotundus L. and Typhaangustifolia L. Journal of Medicinal Plants Studies. **2017**, 5: 203-205.

*[2]* Garg, V. K.; Paliwal, S. K. anticonvulsant activity ofethanolic extract ofcynodondactylon.Der Pharmacia Sinica. **2011**, 2, 86-90.

*[3]* Gunji, V., Swarupa, T. R., Vani, M., Vineela, P.A.J. In-vitro anticancer activity of petroleum ether extract of cynodondactylon. Journal of Pharmacognosy and Phytochemistry. **2015**, 4: 164-168.

*[4]* Dhanapal, V., Thavamani, S. B., Muddukrishniah, Kumar, S., (2017). Pharmocognostical and phytochemical evaluation of stem of cynodondactylon. Journal of Pharmacognosy and Phytochemistry. **2017**, 6: 1995-1998.

*[5]* Kondaveeti, S. B., Ivvala, A. S., Dabburu, K.,Saleem, B.,Inampudi, S.Indigenous effect of cynodondactylon in experimental induced ulcers and gastric secretions. International Research Journal of Pharmacy. **2012**, 3: 301-304.

ISSN 2348 – 8034
Impact Factor- 5.070

*[6]* SivasangariRamya, S., Vijayanand, N., Rathinavel, S. Antidiabetic activity of cynodondactylon (L.) pers. extracts in alloxan induced rats. International Journal of Pharmacy and Pharmaceutical Sciences. **2014**, 6: 348-352.

*[7]* Sai Koushik, O., SrinivasaBabu, P., Ramadoss, K., (2015). Isolation of anticancer bioactive and in vitro evaluation of antioxidant and anticancer activity of cynodondactylon (L.) pers. translational Biomedicine. **2015**, 6: 3-23.

*[8]* Kanimozhi, D.; Rathabai, V. Evaluation of phytochemical antioxidant antimicrobial activity determination of bioactive components of ethanolic extract of aerial and underground parts of cynodondactylon L. International journal of scientific research and reviews. **2012**, 1, 33-48.

*[9]* Kalita, P., (2016). Studies on behaviour of ethanolic and dichloromethanic leaf extract of cynodondactylon from Assam using thin layer chromatography. Research Journal of Recent Sciences, 5: 24-27.

*[10]*Herborne, J. B. Phytochemical methods 3rd Edn. Chapman and Hall Ltd., London. **1973**, 135-203.

*[11]*Banu, K. S.; Cathrine, L. General techniques involved in phytochemical analysis. International Journal of Advanced Research in Chemical Science. **2015**, 2:25-32