

**Fig. 1: Gas chromatography mass spectrometry analysis spectrum of black plum seed extract**

**Table 1: Specification of GC-MS**

Conditions during GC-MS analysis	
Runtime (min)	54.09
Injection volume(μl)	1.00
Scans	6439
Low mass (m/z)	40
High mass (m/z)	400
Gas	Helium
Solvent	Hexane

GC-MS: Gas chromatography-mass spectrometry

variety of components from their mass spectra. In the present study, black plum seed powder is used for extraction and analysis to study the constituents. Black plum seed extract is extracted by solvent extraction technique using Soxhlet extractor with hexane as a solvent. The GC-MS analysis is carried out at SAIF, Chandigarh University. The operating conditions used in the GC-MS analysis are given in Table 1.

## RESULTS AND DISCUSSION

The GC-MS chromatography of black plum seed extract shows different peaks (Fig. 1). Each peak is representing a constituent present in the extract. These peaks are further analyzed and the fractions. So obtained, at different retention time is characterized by MS, which is represented in Fig. 2.

GC-MS analysis of black plum seed extract reveals that the seed contains 10 different compounds. Table 2 shows that, among all compounds, compound with retention time 20.33 shows highest concentration (39.98 %), followed by compound with retention time 14.42 (30.28 %), compound with retention time 12.39 (20.30 %), compound with retention time 11.29 (2.61 %), compound with retention time 10.95 (1.63 %), compound with retention time 11.34 (1.49 %), and concentrations of remaining compounds are <1%. These are probable compounds based on GC-MS compound library search.

**Table 2: (a) probable compounds present in black plum seed extract**

Compound name	Area %	Molecular formula	Molecular weight	RT (min)	Peak area	Structure
Oleic acid	30.28	C <sub>18</sub> H <sub>34</sub> O <sub>2</sub>	282	14.42	155781647.79	
n-hexadecanoic acid	20.30	C <sub>16</sub> H <sub>32</sub> O <sub>2</sub>	256	12.39	104407935.16	
Cyclooctasiloxane, hexadecamethyl	0.79	C <sub>16</sub> H <sub>48</sub> O <sub>8</sub> Si <sub>8</sub>	593.2315	10.04	4076063.86	
1-monolinoleoylglycerol trimethylsilyl ether	1.45	C <sub>27</sub> H <sub>54</sub> O <sub>4</sub> Si <sub>2</sub>	498	11.94	7461639.22	
Octadecanal, 2-bromo-	2.61	C <sub>18</sub> H <sub>35</sub> BrO	346	11.29	13411130.27	
Cyclohexasiloxane, dodecamethyl-	0.79	C <sub>12</sub> H <sub>36</sub> O <sub>6</sub> Si <sub>6</sub>	444.924	7.24	4081565.85	
Cycloheptasiloxane, tetradecamethyl-	0.69	C <sub>14</sub> H <sub>42</sub> O <sub>7</sub> Si <sub>7</sub>	519.078	8.72	3531066.64	
Pyrazole[4,5-b]imidazole, 1-formyl-3-ethyl-6-á-d-ribofuranosyl-	1.63	C <sub>12</sub> H <sub>16</sub> N <sub>4</sub> O <sub>5</sub>	296.283	10.95	8380945.03	
Stearic acid, 3-(octadecyloxy) propyl ester	1.49	C <sub>39</sub> H <sub>78</sub> O <sub>3</sub>	595.05	11.34	7641092.59	
Benzaldehyde, 2,4,5-trimethoxy-	39.98	C <sub>10</sub> H <sub>12</sub> O <sub>4</sub>	196.2	20.33	205642953.61	

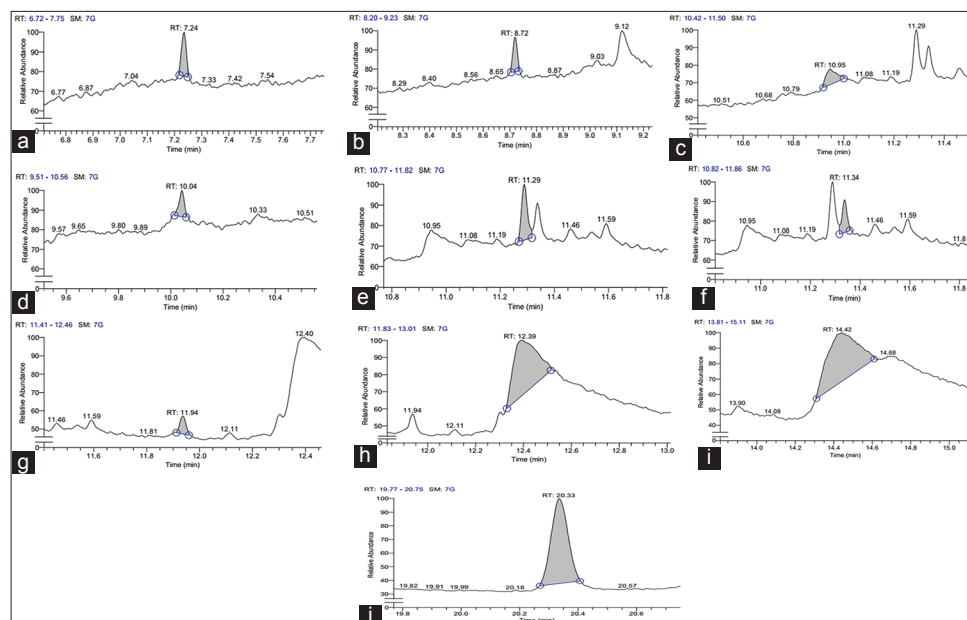


Fig. 2: Prominent peaks of gas chromatography-mass spectrometry of black plum seed extract, (a) spectrum with retention time = 7.24, (b) spectrum with retention time = 8.72, (c) spectrum with retention time = 10.04, (d) spectrum with retention time = 10.95, (e) spectrum with retention time = 11.29, (f) spectrum with retention time = 11.34, (g) spectrum with retention time = 11.94, (h) spectrum with retention time = 12.39, (i) spectrum with retention time = 14.42, (j) spectrum with retention time = 20.33

Table 2: (b) Antimicrobial activity of few compounds of black plum seed extract

S. no	Compound name	Reported bioactivity
1	Oleic acid	Antimicrobial
2	n-hexadecanoic acid	Anti-inflammatory, Antioxidant, hypocholesterolemic nematocide, pesticide, anti-androgenic flavor, hemolytic, 5-Alpha reductase inhibitor, potent mosquito larvicide
3	Cyclooctasiloxane, hexadecamethyl	Conditioning agent
4	1-Monolinoleoylglycerol trimethylsilyl ether	Antimicrobial Antioxidant, Anti-inflammatory antiarthritic, antiasthma, diuretic
5	Octadecanal, 2-bromo-	Nontoxic and efficient anti-microbial agents

Black plum seed extract contains 10 different compounds. From these ten compounds, 5 compounds possess antimicrobial properties. Oleic acid possesses antimicrobial property [17]. n-hexadecanoic acid possesses following properties: Anti-inflammatory, antioxidant, hypocholesterolemic nematocide, pesticide, anti-androgenic flavor, hemolytic, 5-alpha-reductase inhibitor, and potent mosquito larvicide [17]. Cyclooctasiloxane and hexadecamethyl are used as conditioning agent [18]. 1-monolinoleoylglycerol trimethylsilyl ether possesses following properties: Antimicrobial, antioxidant, anti-inflammatory, antiarthritic, antiasthma, and diuretic [19]. Octadecanal, 2-bromo- is non-toxic and efficient antimicrobial agent [20].

## CONCLUSION

The work presented relates to the study of GC-MS analysis of the extracts of black plum seed obtained using solvent extraction with hexane as a solvent. The extract is found to contain many medicinally active compounds. **Ten compounds are identified and details presented, five of which are found to exhibit antimicrobial activity against different diseases.** The medicinally active compounds can be isolated and considered for the preparation of medicine.

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## AUTHORS' CONTRIBUTIONS

All authors have equally contributed at all stages of the work except extraction; extraction was done by Abdul Jaleel A. H under the

supervision of Dr. Yusuf Haneef Shaikh. Analysis of chromatography report was done with the help of Dr. Mazhar Farooqui.

## CONFLICTS OF INTEREST

The author hereby declares no conflict of interest regarding the manuscript and experimentation done.

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