



## STANDARD QUALITY IMPRINTS OF GUIZOTIA ABYSSINICA CASS; AN EDIBLE SEED OIL

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**ABSTRACT** **ABSTRACT:** *Guizotia abyssinica* Cass. source of edible seed oil with high nutritional index. The oil and seeds are use as food as well as medicine.

**MATERIALS AND METHODS:** Seeds were collected from Gadag district authenticated, oil is extracted by cold compression method in Ghani. Organoleptic, Standard parameters studied using customary methodology followed by HPTLC.

**RESULTS:** The percentage oil yield by mechanical pressing was 40% w/w. Oil has yellow orange colour, viscous, with characteristic nutty smell. Refractive index, specific gravity & viscosity, acid value, saponification value, Iodine value, Unsaponifiable matter, peroxide value, determine the nature as well as quality of oil. HPTLC revealed its phytochemical constituents.

**CONCLUSION:** Seed oil of *Guizotia abyssinica* Cass. has been investigated scientifically to record the Standard parameters, HPTLC.

**KEYWORDS :** *Guizotia abyssinica* Cass., Ghani, extraction, HPTLC

**INTRODUCTION:**

*Ayurveda*, traditional healing system suggests each person is having his own diet principles as per his constitution<sup>1</sup>. Oils and fats being essential part of diet, simultaneously one should select his particular fat as per his metabolism, geographical area, constitution, work style etc. *Guizotia abyssinica* Cass. of *Compositae* family, an annual herb, the edible seeds are of which source of edible oil<sup>2</sup>. The seeds are as such eaten, and the oil extracted out of these form a source of healthy oil in some parts of India. From matured whole seeds edible oil is extracted by mechanical pressing.<sup>3</sup> Oil and whole seeds are also used traditionally in rheumatism, common cold, cough etc.<sup>4,5</sup> Oil is also found mixed with other edible oils. Quality imprints of natural resources are essential facts either to popularize them, concurrently to prevent admixture<sup>6</sup>. Hence with all these background, a study has been designed to determine standard parameters of *Guizotia abyssinica* Cass. oil along with HPTLC.

**MATERIALS & METHODS**

Matured seeds of *Guizotia abyssinica* Cass. were collected from Gadag district, cleaned properly from extraneous matter. Oil extracted out of these seeds by cold pressing as per improvised traditional method. Oil collected in sterilized bottles and used for further study. Standard parameters of oil marked as per Ayush Guidelines. HPTLC of oil was carried out as per standard protocol<sup>7</sup>.

**PREPARATION, OF GUIZOTIA ABYSSINICA CASS. OIL**

Matured, Cleaned seeds of, *Guizotia abyssinica* Cass. around 24 Kg were fed into a commercial Ghani (traditional Indian oil expeller), Model no. SEPG15, Shyam Engineering Ltd., Rajasthan India, running at 60 rpm powered by a 3HP motor. No any special processing of seed was done before oil extraction.

Oil which start ooze out after an initial 5 min of pressing was simultaneously filtered and collected in a separate tank at the bottom of the Ghani. Gradual formation of hardened cake mass was also observed during pressing. Generation of heat due to friction was observed during pressing, however, the temperature of the seeds and the extracted oil while pressing maintained between 50–55°C and 40–45°C, respectively. Pressing was continued for 35–40 min till the oil stopped oozing out at the bottom of the Ghani, which was taken as the end point of the pressing process. Later, the hardened oil cake was removed from the Ghani and collected separately. The oil thus collected was filtrated & stored pet in jars, deposited at SDM centre for Research in Ayurveda and Allied sciences with Voucher specimen No.18031201 for further study.

**ORGANOLEPTIC CHARACTERS OF GUIZOTIA ABYSSINICA CASS. OIL:**

Organoleptic characters of the test drug oil like appearance, colour, odour, touch & clarity were recorded<sup>8</sup>.

**STANDARD PARAMETERS OF GUIZOTIA ABYSSINICA CASS. OIL:**

Refractive index, specific gravity, viscosity, acid value, saponification value, iodine value, peroxide values were determined as per standard methodology<sup>9,7</sup>.

**HPTLC:**

5ml of *Guizotia abyssinica* Cass seed oil sample is dissolved in 10 ml of chloroform, 2, 6, 9µl of the sample was applied on a pre coated silica gel F254 on aluminum plates at a band width of 8 mm using Linomat 5 TLC applicator. The plate was developed in Toluene – Ethyl acetate (9:1); developed plates were visualized under short UV, long UV, and after derivatisation in vanillin-sulphuric acid spray reagent, scanned under UV 254nm, 366nm and 620nm following derivatisation. R<sub>f</sub> value, colour of the spots and densitometric scan were recorded<sup>10</sup>.

**RESULTS:****Quantity Of Oil Extracted Out *Guizotia Abyssinica* Cass.**

The extraction of oil from matured seeds was carried out for about 45min in motor operated Ghani (Screw Press mechanical expeller). Dark yellowish coloured oil started oozing out within 5mins, stored in container.

The oil showed some residues of the seeds, when kept for 24 hrs, bright yellow orange colored oil obtained after decanting. 9.45 kg of oil extracted from 24 kg of seed. Hence the yield of oil is 39.375 %. The total weight of oil cake was about 11.95kg.

**ORGANOLEPTIC CHARACTER:**

The color of the oil was yellowish orange, viscous in nature, oily to touch, with characteristic nutty smell.

**PHYSICOCHEMICAL ANALYSIS:**

Standard parameters of *Guizotia abyssinica* Cass. oil was done as per standard methodology. Results displayed at Table 1.

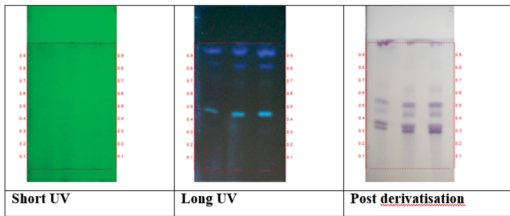
**Table 1. Standard Parametrs Of *Guizotia Abyssinica* Cass. Seed Oil**

Parameter	Results n = 3 %w/w
	<i>Guizotia abyssinica</i> Cass seed oil
Refractive index	1.4717
Viscosity	44.06
Specific gravity	0.9417
Acid value	2.74
Saponification value	217.68
Iodine value	136.87
Unsaponifiable matter (%)	1.56
Peroxide value	0.80
Rancidity	Not oxidized

**HPTLC:**

HPTLC photo documentation of Chloroform soluble portion of *Guizotia abyssinica* Cass. seed oil showed the visible 3, 4 major spots in long UV and post derivatisation respectively. Rf values for oil in short UV not observed, 0.44, 0.70, 0.80, 0.92 are the Rf values in long UV. Post derivatisation showed the Rf values 0.30, 0.34, 0.44, 0.51, 0.62, 0.65 & 0.88.

**Fig. 1: HPTLC photodocumentation of chloroform soluble portion of sample *Guizotia abyssinica* Cass seed oil**



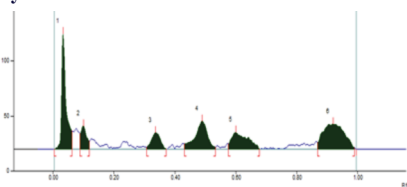
Track 1: *Guizotia abyssinica* Cass seed oil- 3µl  
 Track 2: *Guizotia abyssinica* Cass seed oil- 6µl  
 Track 3: *Guizotia abyssinica* Cass seed oil- 9µl  
 Solvent system - Toluene: Ethyl acetate (9.0: 10)

**Table 2: Rf values of chloroform soluble portion of *Guizotia abyssinica* Cass. seed oil**

Short UV	Long UV	Post derivatisation
-	-	0.30 (D. purple)
-	-	0.34 (D. purple)
-	0.44 (F. aqua blue)	0.44 (D. purple)
-	-	0.51 (D. purple)
-	-	0.62 (L. purple)
-	-	0.65 (L. purple)
-	0.70 (FD. blue)	-
-	0.80 (FD. blue)	0.80 (L. purple)
-	0.92 (FD. blue)	-
-	0.93	-

\*D- dark; L- light; F - fluorescent

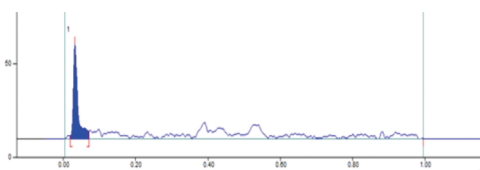
**Figure2: Densitometric scan of the chloroform soluble portion of *Guizotia abyssinica* Cass. seed oil**



Track 3, ID: *Guizotia abyssinica*

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.00 Rf	0.1 AU	0.03 Rf	105.0 AU	51.36 %	0.06 Rf	16.7 AU	1080.8 AU	25.89 %
2	0.09 Rf	14.4 AU	0.10 Rf	20.9 AU	10.25 %	0.12 Rf	7.3 AU	291.7 AU	6.99 %
3	0.31 Rf	1.9 AU	0.34 Rf	15.1 AU	7.37 %	0.37 Rf	0.1 AU	315.7 AU	7.56 %
4	0.43 Rf	4.9 AU	0.49 Rf	25.4 AU	12.41 %	0.53 Rf	1.9 AU	734.1 AU	17.58 %
5	0.58 Rf	4.8 AU	0.60 Rf	15.2 AU	7.44 %	0.68 Rf	0.2 AU	585.9 AU	14.03 %
6	0.87 Rf	6.3 AU	0.92 Rf	22.8 AU	11.17 %	0.99 Rf	1.4 AU	1166.8 AU	27.95 %

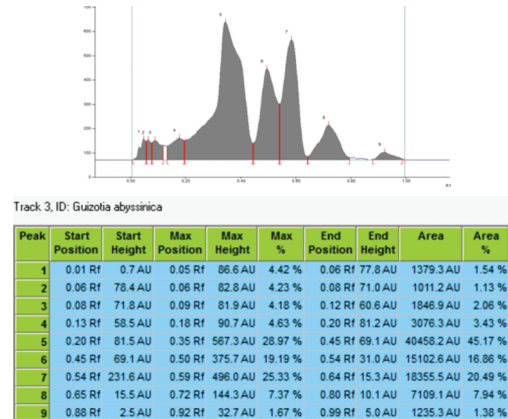
**Fig 2a. At 254nm**



Track 3, ID: *Guizotia abyssinica*

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.02 Rf	1.6 AU	0.03 Rf	50.8 AU	100.00 %	0.07 Rf	4.0 AU	442.2 AU	100.00 %

**Fig 2b. At 366nm**



**Fig 2c. At 620nm**

**DISCUSSION:**

*Guizotia abyssinica* Cass. of *Compositae*, is cultivated for its edible oil seeds<sup>11</sup>. The oil can be extracted by mechanical pressing or by solvent extraction. Traditional practice of extraction by heating, grinding and hydraulic press is found in few places, but mechanical pressing is rationally in use, suitable for small scale oil production<sup>12</sup>. The cleaned 12x2 kg of seeds fed to the expeller, dark, dusky yellow orange coloured oil obtained after 5 min. The black colored hard cake was collected from outlet. The crude oil after pressing collected in container allowed to stand for 24hrs, yellow orange colored oil was filtrated after decanting. The yield was about 39.375 %. and cake weighed about 11.9 kg.

Preparation of quality standards of natural products are essential part in drug, as either to promote, or future researches<sup>13</sup>. The oil exhibited the yellow orange colour, resembling the other crude oil, due to presence of colouring matter of the seed. Nutty smell individualized it from other; clarity indicated the absence of physical impurities.

Refractive index is a value calculated from the ratio of the speed of light in a vacuum to that in a second medium of greater density<sup>14</sup>. This value reflects the density of test drug. The seed oil showed the Refractive index 1.4717% w/w. The specific gravity is the ratio of the density of a substance to the mass of reference substance (H<sub>2</sub>O). 0.9417 % w/w is the specific gravity showed by the seed oil. Viscosity is related to chemical properties like chain length & saturation. 44.06% w/w is viscosity, may be due to saturation or dissolved impurities under mechanical press. Acid value is defined as the weight of KOH(Potassium hydroxide) in mg needed to neutralize the organic acids present in 1g of fat<sup>15</sup>. Acid value measures the free fatty acids in the oil, higher the value, lower the storage quality. 2.74 % w/w is the acid value. Saponification value is an index of average molecular mass of fatty acid in the oil sample<sup>16</sup>. 217.68% w/w is the value for saponification, that was in the standard range.( 180-195). Unsaponifiable matter is 1.56%w/w. Iodine value measures the degree of unsaturation in a fat or vegetable oil. Which was found 136.87%w/w. Peroxide value is an indication of the amount of hydro peroxides present in oil which was 0.80%w/w.

**HPTLC**

Chloroform soluble portion of *Guizotia abyssinica* Cass. seed oil in different concentration applied over HPTLC plates. No visible spots under short UV, 3 spots over long UV, 3-4 spots after post derivatisation were observed. Densinometric scan recorded Rf values 044, 0.70, 0.80, 0.92 under Long UV, whereas 0.30, 0.34, 0.44, 0.51, 0.62, 0.65& 0.80 were the Rf values at post derivatisation.

**CONCLUSION:**

Drug research begins with the identification & authentication of drug followed by the purity and quality control standards<sup>17</sup>. *Guizotia abyssinica* Cass. seed oil extraction method, quality control study definitely contributory in the field of drug research.

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