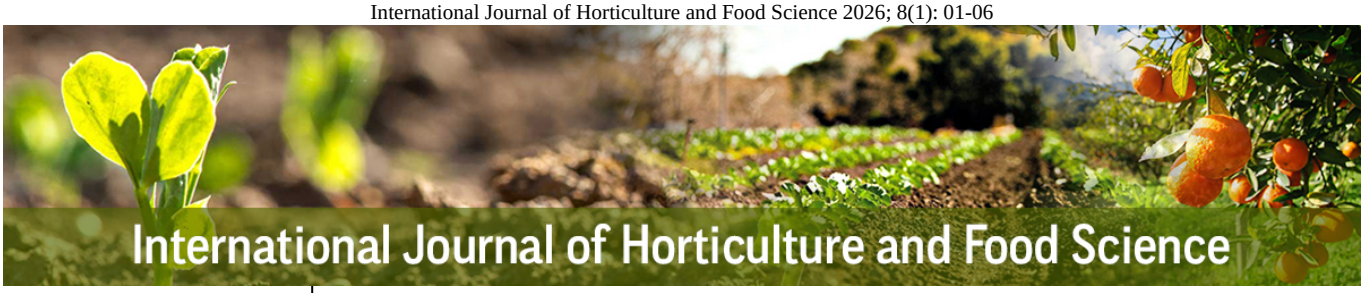

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UV spectrophotometric methods for quantitative determination of *Zingiber officinale* extraction of qualitative information

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Abstract
Background: Through this research study preparing the Homoeopathic mother tincture Ginger in ethyl alcohol base with ratio (1:9) and the 1x *Zingiber officinale* is identified under the quality assessment with UV- Visible spectrophotometer and HPTLC.
Methodology: Preparation of *Zingiber* Q in the proportion of (1:9), 1 part is Ginger ryzomes and 9 part is alcohol. After preparing this from each group (3-4) ml samples were taken in a sterile cuvette placed inside the UV- VIS Chamber to pass it under UV- VIS and HPTLC**.**
Results: At 459 wavelength the absorbance value is 0.3 that is biosynthesised nano silver particle. A high concentration or a very long route length in the UV analysis is suggested by the value of 3.991 at the 346 nm wavelength, which suggests a very high absorbance and is probably at the absorption maximum for particular chemicals in the *Zingiber* extract. We have observed that the absorbance value for 1x potency 300-500 nm is 0.261 at 317 nm wave length and 0.525 at 373 nm. The absorbance values for the absolute alcohol are 0.265, 0.050, and 0.106 at 277, 320, and 376 nm.

Keywords: Spectroscopic, potency, metabolites, vehicle control

1. Introduction
Ginger, or *Zingiber officinale*, is a herbaceous perennial plant in the *Zingiber*aceae family that is likely native to southeast Asia. Its strong, fragrant rhizome, or underground stem, is used as a spice, flavouring, food, and medication [1].
The Greek word *Zingiber*is, which is taken from the Sanskrit name of the spice, singabera, is the source of the generic name *Zingiber* for ginger. Ginger has long been used in China and India, and by the first century CE, traders had brought it to the Mediterranean. It was well-known in England by the eleventh century. Soon after the conquest, the Spanish introduced ginger to Mexico and the West Indies, and by 1547, Santiago was exporting ginger to Spain. Also see the commerce in spices [1, 2]
Ginger's leafy stems reach a height of approximately one meter, or three feet. The elongated, 15-30 cm (6-12 in) long leaves emerge from sheaths that round the stem and alternate in two vertical rows. The flowers are arranged in dense, cone like spikes that are 5 to 8 cm (2 to 3 inches) long and 2.5 cm (1 inch) thick. They are made up of overlapping green bracts that may have yellow edges. One little purple and yellow-green blossom is enclosed by each bract. Rootstock cuttings are used to grow ginger, and this method of cultivation has been used for so long that it no longer goes to seed.
The rhizomes are harvested by simply removing them from the ground, cleaning them, and letting them dry in the sun. The dried ginger rhizomes might be palmate, branching, or have an uneven form. They range in hue from pale buff to light brown to dark yellow. Ginger can be scraped or peeled (with all of its cork, epidermis, and hypodermis removed), partially scraped, or unscraped (with all of its cork layer) [3]
One of the most often used varieties of ginger in trade is dry ginger. When ginger reaches full maturity (8-10 months), the rhizomes are removed for dry ginger. After soaking them in water, the outer peel is manually scraped off with a wooden knife or bamboo splinter because it is too delicate to be done by a machine [4]. The consuming centres grind the entire dried rhizomes [5]. Fresh ginger is harvested much younger and doesn't require any additional processing after harvest [3].

ethnobotanical Because of its biological and therapeutic qualities, the genus *Zingiber* is utilized extensively around the world *Z. officinale*, or ginger, is the most well-known and extensively researched member of this genus for its potential health benefits.

Import and Export of Ginger

Ginger goes through a number of steps before being shipped either domestically or abroad. Farmers start the voyage by selling some of their goods to village vendors who pick it up at the farm gate [6]. After being harvested, the produce is transported to the nearest assembly market before being delivered to major marketing facilities at the regional or local levels. Farmers who produce a lot of food will deliver it straight to local or regional marketplaces. After the goods have "reached [the] regional level markets, they are cleaned, graded, and packed in sacks of about 60 kg" [7]. After that, they are transported to terminal markets like Bombay, Kochi, and New Delhi [8].

The marketing channels for vegetables in India are followed by the states from where ginger is exported, and the procedures are comparable to those for domestic transportation. But rather than arriving at a terminal market following the regional forwarding centers, the produce will first arrive at an export market before being transported by car, airplane, or boat to its ultimate international destination, where it will eventually reach a local retail market and, once purchased, the consumer [9].

The most common way that dry ginger is exported between Asian nations is through a special distribution system that includes a network of tiny retail establishments10. In many places, fresh ginger is only found in small stores that are exclusive to particular ethnic communities. In other nations, both fresh and preserved ginger are frequently sold directly to supermarket chains. In addition to "Saudi Arabia, the United Arab Emirates, Morocco, the United States, Yemen Republic, the United Kingdom, and Netherlands," India often sends its ginger and other vegetable output to neighbouring Bangladesh and Pakistan

Despite being the world's biggest producer of ginger, India only contributes roughly 1.17% of all ginger exports, failing to play the role of a major exporter [11]. With "more than 65% of the total cost incurred is toward labour and seed material purchase" and little revenue from exports, ginger cultivation in India is an expensive and dangerous industry. [11] Since there are no production losses or price drops, which are difficult to prevent, the farm owner might profit. Ginger grown in intercropping systems as opposed to as a pure crop has a higher benefit-to-cost ratio than dry ginger production [11]

Metabolites

The most well-known of these chemicals are the vanilloids, which include gingerols (found in fresh ginger) and shogaols (found in dry ginger). *Zingiber* metabolites are a broad set of substances discovered in the *Zingiber* genus. Terpenoids (such as zerumbone), flavonoids, and other organic acids and fatty acids are additional significant metabolites. These substances give the plant its distinctive strong flavour and scent as well as its therapeutic qualities, which include anti-inflammatory and antioxidant benefits [12]

Use

As previously mentioned, the extraction yield of *Z. officinale* EO ranges from 1.5% to 3%, and its color varies from pale yellow to light amber. Their biological qualities, including antibacterial, antioxidant, cytotoxic, insecticidal, and anti-inflammatory actions as well as food preservation qualities, have been shown by several research. 12

Materials and Methods

The healthy *Zingiber* are purchased from the market. Then they are taken to the mortar and pestle after cutting it in small pieces.

Type of Study

Experimental study

Duration of study

3 week

Site of study

- Jawaharlal Nehru Homoeopathic Medical College, Parul University
- Department of Homoeopathic Pharmacy, PIHR, Parul University, Vadodara, Gujarat, India
- **Tool used UV:** Vis spectrophotometer 1900 Series

Model

UV 1900i (A12536082607) (Double beam) Medicinal substances *Z. officinale* mother tincture.

Materials used

1. Beaker (50 ml) capacity
2. Measuring cylinder (100 ml) capacity.
3. Pipette
4. Funnel
5. Mortar Pestle Drug & Vehicle ratio (1:9)

Procedure

The formulation is prepared with standard *Z. officinale* pulp and Absolute alcohol. Wave length should be from 300 -700 nm.

Measurement

- Take 1 part of *Z. officinale* pulp, clean beaker and add 9 parts of alcohol by pipette.
- Keep the sealed beaker for 15 days.
- After 15 days this mixture is filtrated by watmann's filter paper.
- **Labelling:** Paste labelled on body of hard glass bottle with Drug name, Quantity, Vehicle name, quantity, Drug and vehicle ratio, Manufacturer Date, Caution.
- **Storage:** After preparation, such formulation should be kept in a hard glass bottle and store in a cool, dark place, away from sunlight, dampness, and strong-smelling bottles.

Results

After preparing formulation, samples were divide into 2 main groups such as; alcohol, main sample group. These were passes under UV- Visible spectrophotometer (Double beam).

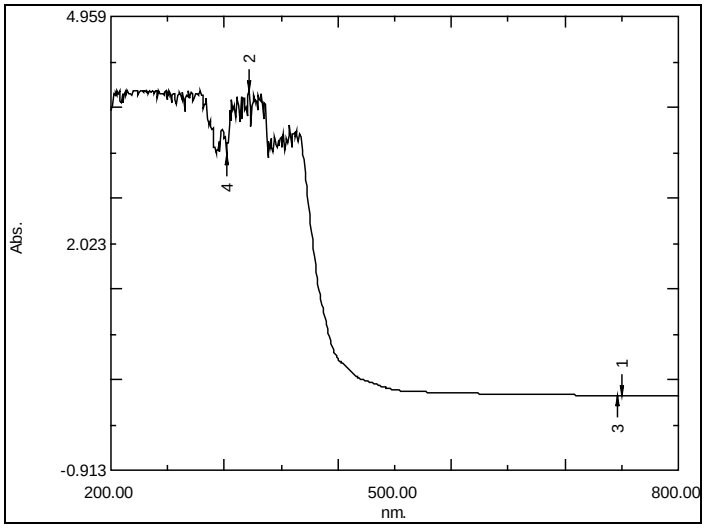

Fig 1: *Zingiber* mother tincture

Table 1: Data of mother tincture,1x and Alcohol

Wavelength	Raw Data 1	Raw Data 2	Raw Data 3
353.00	3.883	0.454	0.090
354.00	3.858	0.461	0.091
355.00	3.742	0.467	0.093
356.00	3.931	0.475	0.095
357.00	3.883	0.481	0.096
358.00	3.859	0.487	0.097
359.00	3.956	0.493	0.098
360.00	3.822	0.498	0.099
361.00	3.636	0.503	0.100
362.00	3.841	0.505	0.101
363.00	3.815	0.510	0.102
364.00	3.827	0.513	0.103
365.00	3.404	0.515	0.103
366.00	3.137	0.516	0.103
367.00	3.341	0.518	0.104
368.00	3.244	0.520	0.104
369.00	3.390	0.522	0.105
370.00	3.258	0.524	0.105
371.00	3.212	0.524	0.105
372.00	3.368	0.525	0.105
373.00	3.399	0.525	0.106
374.00	3.318	0.524	0.105

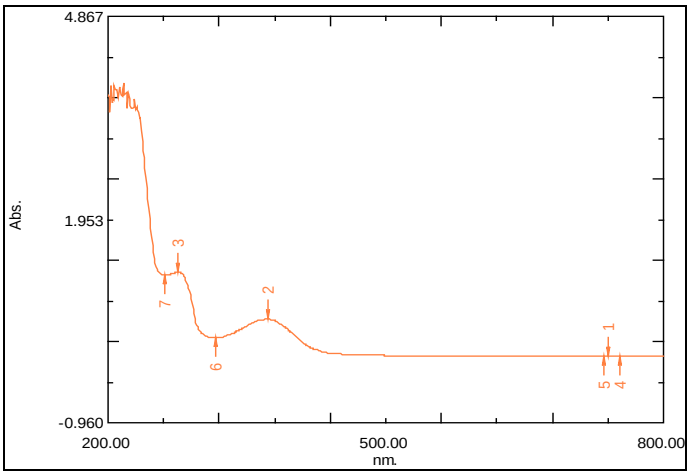

Fig 2: Ginger 1x potency

Table 2: Data of mother tincture,1x and Alcohol

Wavelength	Raw Data 1	Raw Data 2	Raw Data 3
265.00	3.945	1.164	0.254
266.00	3.952	1.167	0.254
267.00	3.964	1.169	0.254
268.00	3.884	1.172	0.254
269.00	3.822	1.173	0.255
270.00	3.937	1.178	0.255
271.00	3.934	1.182	0.257
272.00	3.950	1.189	0.259
273.00	3.983	1.196	0.261
274.00	3.932	1.198	0.263
275.00	3.890	1.200	0.264
276.00	3.972	1.200	0.264
277.00	3.880	1.199	0.265
278.00	3.728	1.195	0.264
279.00	3.904	1.187	0.263
280.00	3.943	1.174	0.261
281.00	3.920	1.158	0.258
282.00	3.987	1.137	0.254

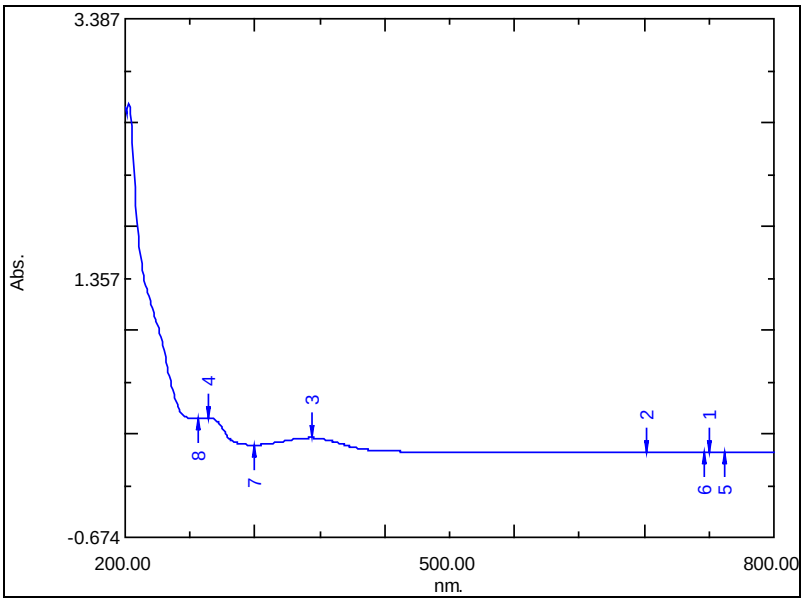

Fig 3: Absolute Alcohol

Table 3: Data of mother tincture,1x and Alcohol

Wavelength	Raw Data 1	Raw Data 2	Raw Data 3
313.00	3.217	0.262	0.052
314.00	3.336	0.262	0.051
315.00	3.206	0.261	0.051
316.00	3.447	0.261	0.050
317.00	3.484	0.261	0.050
318.00	3.490	0.261	0.050
319.00	3.465	0.262	0.050
320.00	3.376	0.263	0.050
321.00	3.400	0.264	0.050
322.00	3.161	0.267	0.050
323.00	3.316	0.268	0.051
324.00	3.324	0.271	0.051
325.00	3.572	0.275	0.051
326.00	3.746	0.278	0.052
327.00	3.611	0.282	0.053
328.00	3.882	0.287	0.054

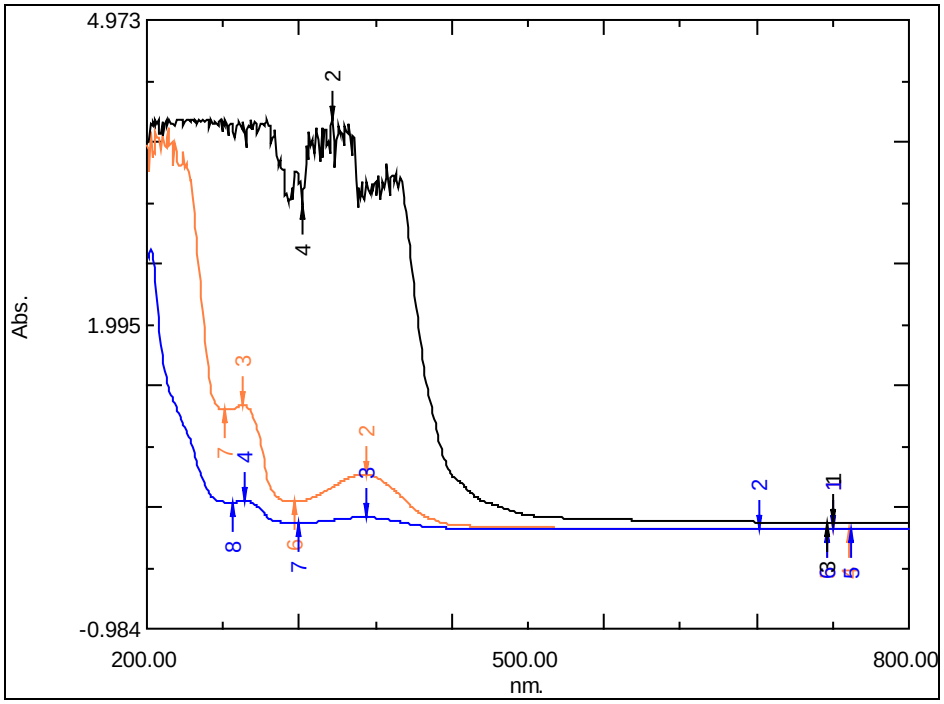

Fig 4: Absolute Alcohol

Table 4: Data of mother tincture,1x and Alcohol

Wavelength	Raw Data 1	Raw Data 2	Raw Data 3
365.00	3.404	0.515	0.103
366.00	3.137	0.516	0.103
367.00	3.341	0.518	0.104
368.00	3.244	0.520	0.104
369.00	3.390	0.522	0.105
370.00	3.258	0.524	0.105
371.00	3.212	0.524	0.105
372.00	3.368	0.525	0.105
373.00	3.399	0.525	0.106
374.00	3.318	0.524	0.105
375.00	3.308	0.523	0.105
376.00	3.267	0.521	0.104
377.00	3.362	0.517	0.103
378.00	3.292	0.513	0.102
379.00	3.381	0.508	0.101
380.00	3.400	0.502	0.099
381.00	3.261	0.495	0.098
382.00	3.444	0.488	0.096
383.00	3.224	0.480	0.095

At 459 wavelength the absorbance value is 0.3 that is biosynthesised nano silver particle. A high concentration or a very long route length in the UV analysis is suggested by the value of 3.991 at the 346 nm wavelength, which suggests a very high absorbance and is probably at the absorption maximum for particular chemicals in the *Zingiber* extract. We have observed that the absorbance value for 1x potency 300-500 nm is 0.261 at 317 nm wave length and 0.525 at 373 nm. The absorbance values for the absolute alcohol are 0.265, 0.050, and 0.106 at 277, 320, and 376 nm.

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Tables 4 Picture 4 All tables and pictures are provided by PIHR, Parul university, Vadodara

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