

Analytical Study of MoringaOleifera Flower's Extract : UV Spectrophotometer & High Performance Liquid Chromatography

Jyoti Rathore¹, Dr. Kiran Thakur², Vandana Rathore³

¹ Department of Chemistry, Atal Bihari Vajpayee Vishwavidyalaya, Bilaspur 495001(C.G.) India.

²Department of Chemistry, Government Bilasa Girls PG College, Bilaspur 495001 (C.G.) India.

³Department of Chemistry, Government Dr. Indrajeet Singh college Akaltara, Champa 495552 (C.G.) India

Abstract – MoringaOleifera is heavenly plant in this universe for its numerous therapeutic activities. Many of its activities has been reported but yet many researches are going on to find out more activity and best of it. Every part of the plant is very useful in every aspect. A part from Leaves, seeds, bark and root , moringa flowers have also been reported for its therapeutic value. This research work focused on the extraction of constituents from Moringa flower and its analytical determination, i.e., UV Spectrophotometer Analysis and HPLC analysis for the validation of the herbal extract as well as for its formulated product if present. Moringa flower is characteristic in its pharmacognostic features. Phenolic compounds, Flavonoids, alkaloids, Terpenoids, Tannins, Glycosides, Steroids, Saponins, Proteins, Amino acids, Vitamin C, Carboxylic acid are the secondary metabolites reported in MoringaOleifera flower. Moringaoleifera also contains many vitamins, micro and macro nutrients. The flower exhibits the pharmacological activity like antimicrobial, anti diabetic, anticancer, for liver and many more.

Keywords –MoringaOleifera, Therapeutic, Characteristic, Purgative, Pharmacognostic.

Introduction –Moringaoleifera is the most famous and wide ranging species. Moringaoleifera is effective in all aspects. Moringaoleifera has been viewed as an attractive plant that was also well known for its therapeutic value due to its phytoconstituents, which were used to treat a wide range of ailments. It is a member of the Moringaceae monogeneric subfamily and family. There are nearly 14 species (including Moringa arborea, which is native to Kenya Moringa. pygmaea, which is native to Somalia, Moringa longituba, which is native to Kenya, Ethiopia, and Somalia and Moringa. stenopetala, which is native to Kenya and Ethiopia). Moringa ruspoliana is an Ethiopian native. (1-2) Moringa ovalifolia is native to Namibia and Angola, Moringa drouhardii and Moringa hildebrandi are native to Madagascar, Moringaperegrine is native to the Red Sea and the Horn of Africa and Moringaconcanensis and Moringaoleifera are native to Northern India's sub-Himalayan tracts. During its season in South India, moringa is the most popular vegetable in daily markets, along with other vegetables. It covers an area of 4,613 ha in other states. It is primarily grown for vegetable purposes in the districts of Dindugal, Trichy, Salem, and Madurai in Tamil Nadu.(3-4) The tree's height ranges from 10 to 12 m, and it is classified as a soft wood tree. The ancient medicinal system known as ayurvedic medicine claimed that it could cure and prevent 300 different types of diseases, and its leaves were used to treat a variety of ailments. Moringa is a multipurpose plant that thrives in semi-arid and water stress environments. Despite the fact that it is not a nitrogen-fixing tree, its various parts can be useful for other purposes. Pods, leaves, and seeds are highly nutritious and can be eaten as vegetables. The oil extracted from the seeds is used in cooking, soap production, cosmetics, fuels, and lamps. Paper can be made from wood pulp. The seeds are used to treat bacterial skin infections.(5-7) The powder made from Moringa seeds is used to detoxify and drink water through clot formation. The meal cake that remains after extracting the oil from the kernels is used as manure. The tree's stem exudes gum, which is used in the paper and pulp industries(8).

Leaves

Moringaoleifera leaves have always been highly nutritious due to their full of vitamins, proteins, and calcium, and they are also a good source of antioxidants. As reported that the leaves demonstrate the following activity lowers blood pressure, used as a remedy for diarrhoea, dysentery, and colitis when mixed with honey, diuretic, rubbed on temples for headache, purgative, used to treat fever, bronchitis, eye and ear infections, scurvy, and mucus membrane inflammation, anthelmintic, skin antiseptic, prescribed for anaemia, and antioxidant(9-11).

Root

Moringa root serves the activity of laxative, purgative, carminative also used to relieve intermittent fever and cold.(12) Also helpful as an abortifacient, cardiac, diuretic and circulatory tonic, used to treat convulsions, nervous debility, rheumatism, hysteria and also articular pain. It reduces lower back pain, kidney pain. It cure plasy, enlargement of spleen, dyspepsia(13-14).

Seed

Human consume roasted seeds of some Moringa varieties, which taste like groundnuts. Moringa seeds are used to treat fever, antihypertensive activity, abdominal tumours, crushed seeds applied to warts, also used as a natural flocculant, relieves pain and swellings in cases of gout or rheumatism, scurvy, prostrate, hysteria, and bladder problems, used as a tonic and purgative, reduces the amount of oxidised lipids in our body(15-18).

Storage

Fresh Moringa flowers can be store in fridge. For long term storage it can be sun dried and pack in air tight container which can be further use (19-20).

Medicinal food Recipies of moringa Flower

In a pot, bring water and 1 teaspoon salt to a boil. Cover and simmer for 2 minutes after adding the Moringa flowers. Then turn off the heat and leave for 9-10 hours or overnight. Strain the flowers and rinse them with fresh water the next morning. Replace them in the pot with fresh water. Allow the water to come to a boil before simmering for 15 minutes. This step is critical for removing the bitterness from the flowers. Once the flowers are cooked, drain the water, mash them with your hands, and squeeze out any excess water. Set it aside. In a kadhai, heat the ghee and add the cumin and mustard seeds. Allow them to sputter. Sauté the onions for 1-2 minutes. Add the tomatoes, legumes, and green chile. Cook for 3-4 minutes and the dish is ready. Sprinkle garam masala and give a gentle mix(21-25).

Materials and collection

Fresh Moringa flowers were collected from district of Korba region, Soxhletapparatus, UV Spectrophotometer(Labtronics), High Performance Liquid Chromatography (Shimadzu SPD 10), Solvents used were Benzene, Chloroform, Hexane and Ethyl Acetate of AR grade from Molychem brand.

Method

The flowers of moringa was collected, washed and sun dried to remove the moisture. The dried moringa flowers were grinded into powder to get the fine particles. 25gm of dried moringa flower powder was subjected into extraction in Soxhlet apparatus for 24hrs. this step is employed for all four non polar solvents Hexane, Benzene, Chloroform and Ethyl acetate to get individual extract. Then these extracts undergone the UV analysis study and HPLC analysis study. 10mg Moringa flower extract of each extract weighed accurately and transferred to 100ml volumetric flask and volume makeup was done through

Benzene, Hexane, Chloroform and ethyl acetate respectively. For every solvent different volumetric flask has been taken. The conc. of each stock solution was 100µg/ml(26-30). These solutions were scanned for 200-400nm in UV Spectrophotometer to determine the maximum absorbance.

For HPLC analysis 10ppm conc. dilution were prepared from the above stock solution of every extract. Wavelength for each extract was taken as per the reported data mentioned below, column C18 used, flow rate 1ml/min, temperature ambient(31-37).

Result and discussion

The extraction of Moringa flowers via soxhlet was performed and further the extract undergone UV-Visible Spectrophotometer analysis and High Performance liquid Chromatography. Through the UV-Visible Spectrophotometer analysis maximum absorbance was determined. The maximum absorbance of moringa flower extract in various solvents are 291nm, 255nm, 296nm, 290nm for extracts of Benzene, Ethyl Acetate, Chloroform and Hexane respectively. This data is helpful for the HPLC analysis.

The conc. of each of the extract prepared for HPLC analysis were 10ppm at 1ml/min flow. The HPLC analysis data areas follows for moringa flower benzene, ethyl acetate, Chloroform and Hexane extract, the retention time was 5.015 min, 5.540min, 3.20min and 4.432min respectively. The peak height of Benzene Moringa Flower extract chromatogram reported was 121508.203 with peak area 659264.313, peak height of chloroform Moringa Flower extract reported was 146874.047 with peak area 1164076.00, peak height of Ethyl Acetate Moringa flower extract was 271442.469 with peak area 2020789.62, the peak height of Hexane Moringa Flower extract was 130465.898 with peak area 3114906.780.

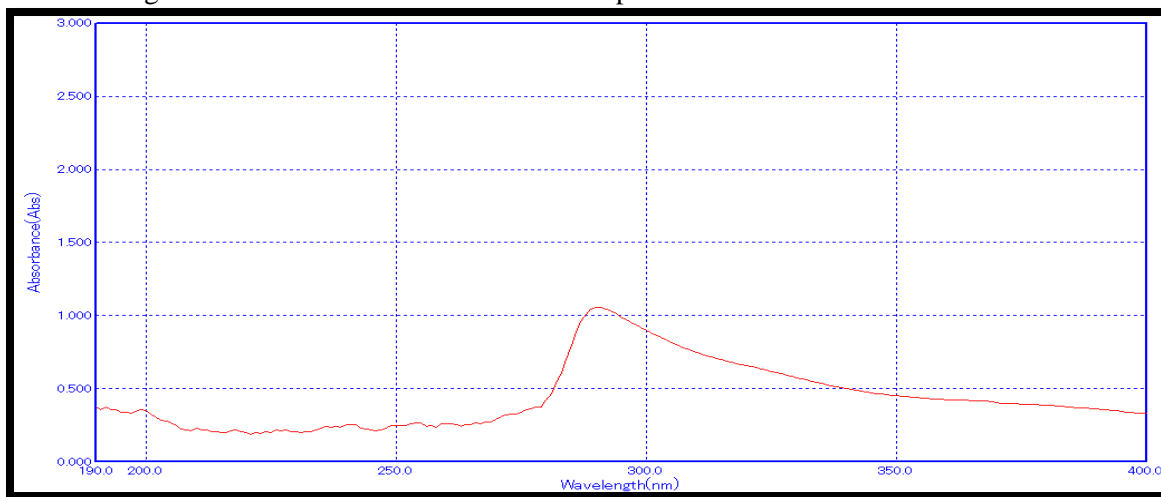


Figure 1 UV Spectra of Moringa Flower Benzene extract

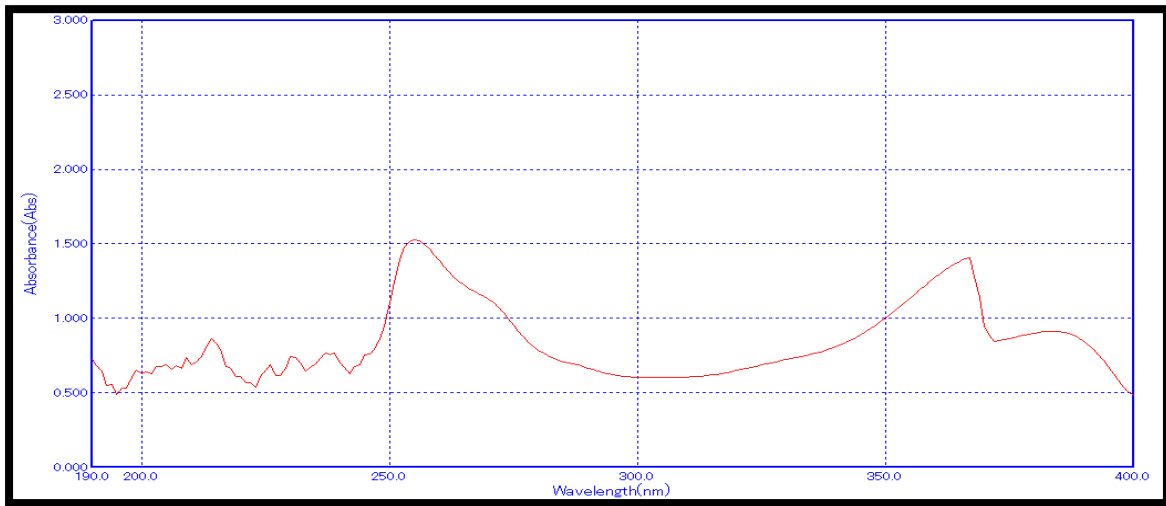


Figure 2 UV Spectra of Moringa Flower Ethyl Acetate extract

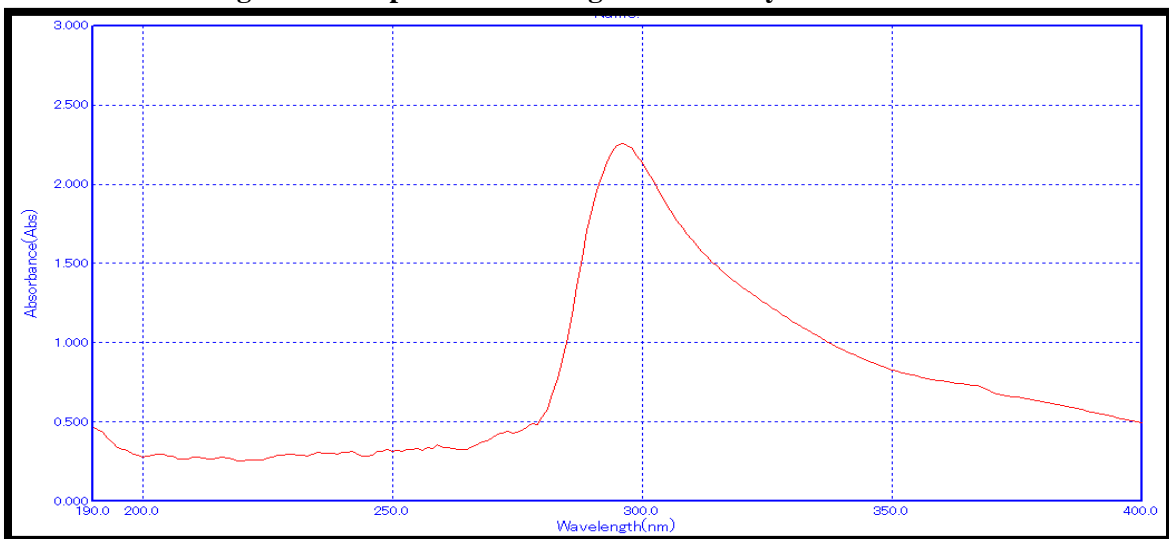


Figure 3 UV Spectra of Moringa Flower Chloroform extract

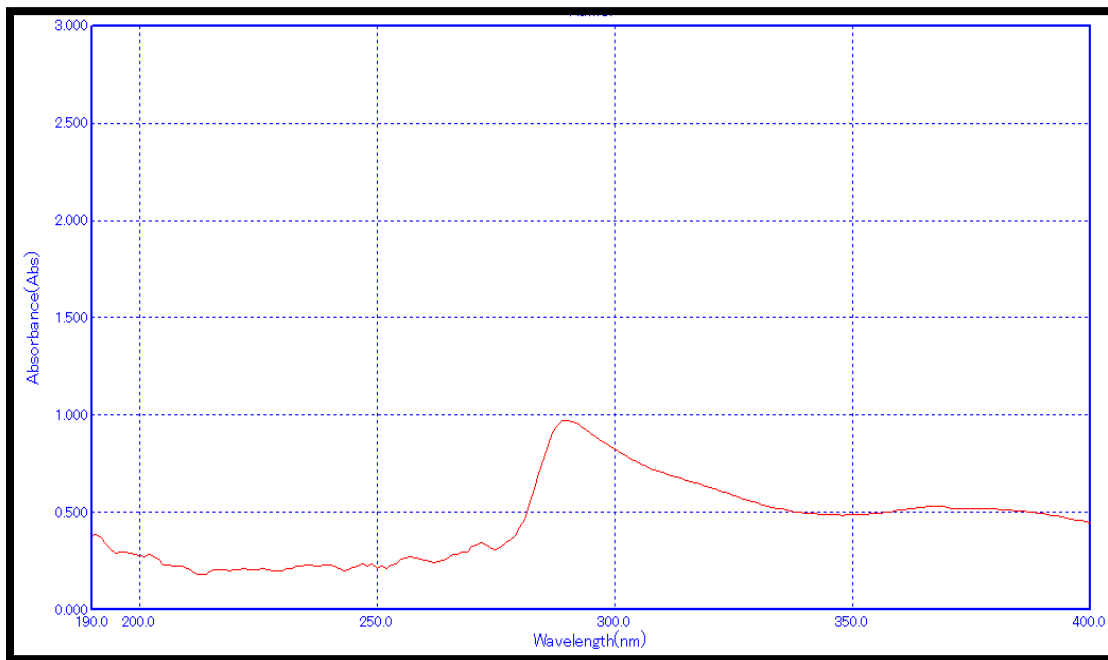


Figure 4 UV Spectra of Moringa Flower Hexane extract

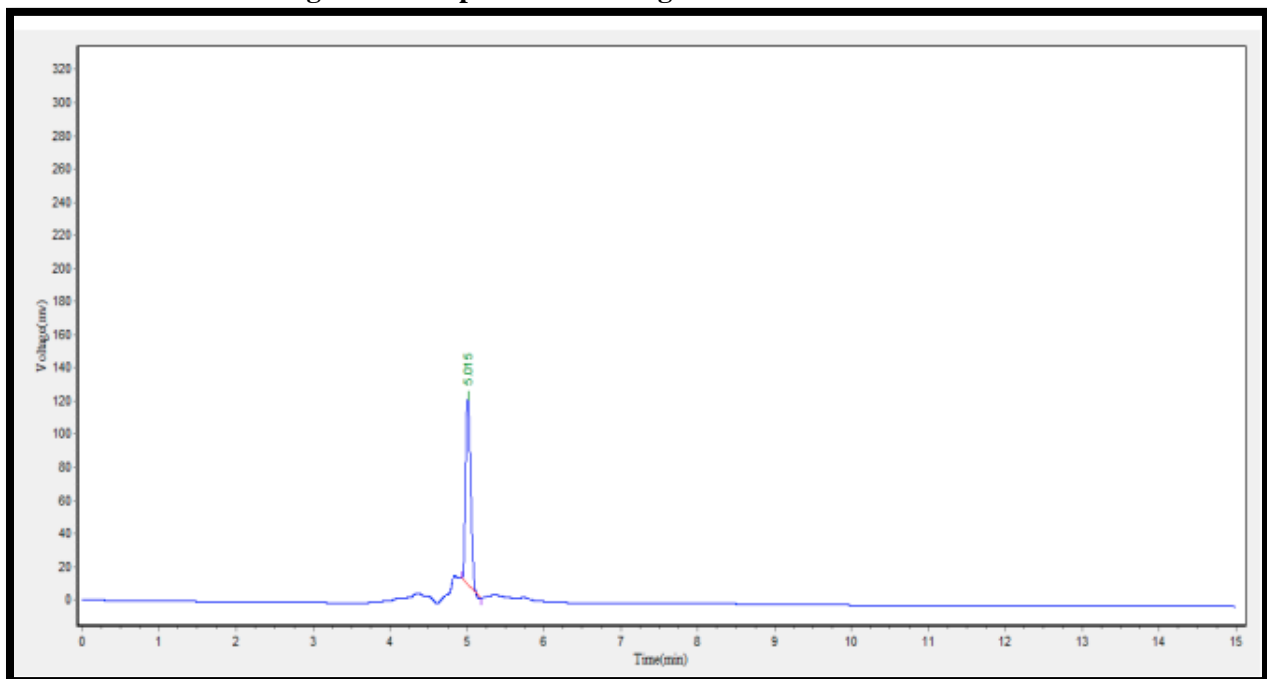


Figure 5 Moringa Flower Benzene extract Chromatogram

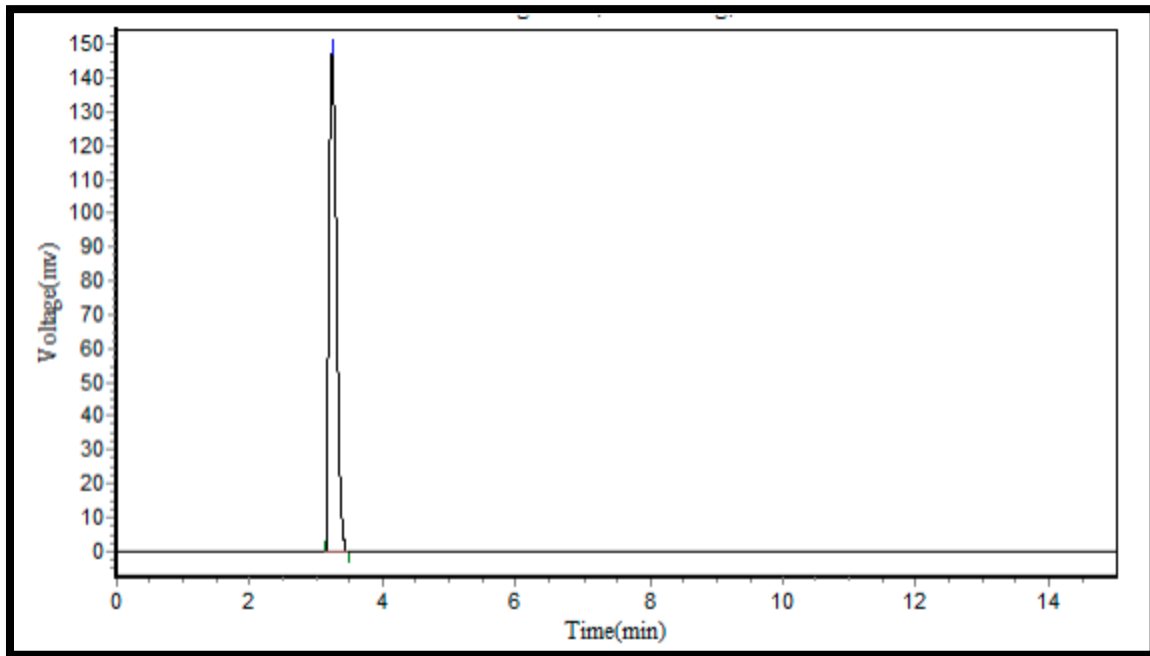


Figure 6 Moringa Flower Chloroform extract Chromatogram

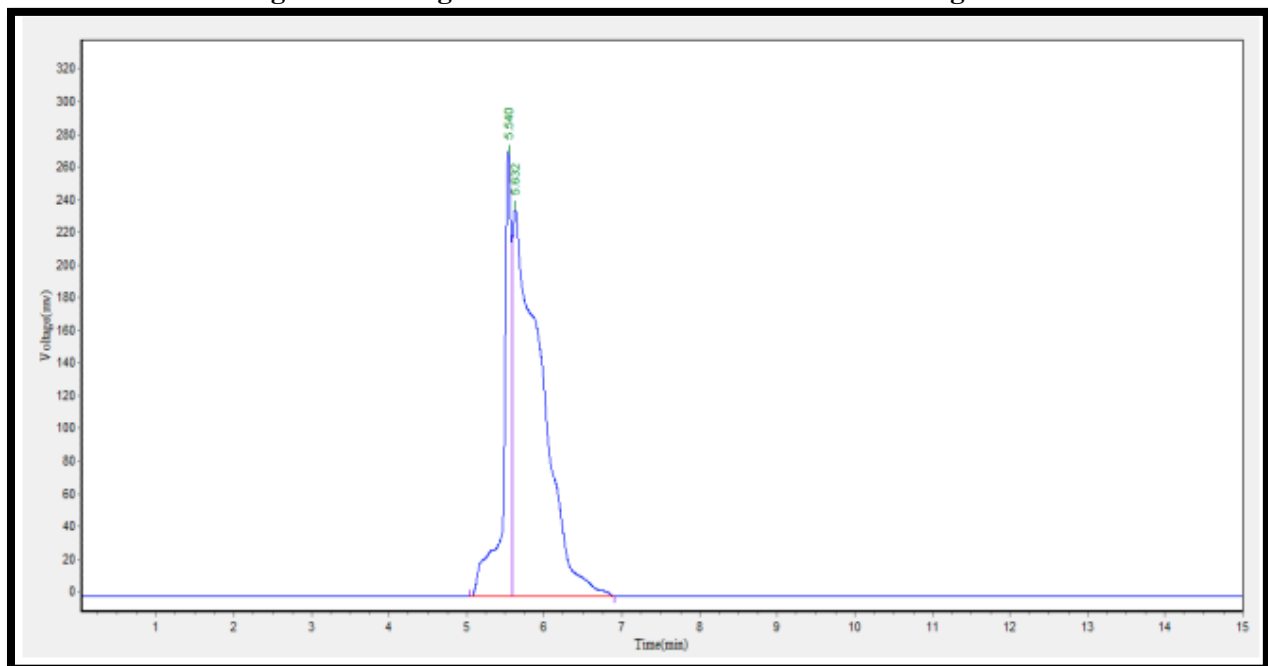


Figure 7 Moringa Flower Ethyl Acetate extract Chromatogram

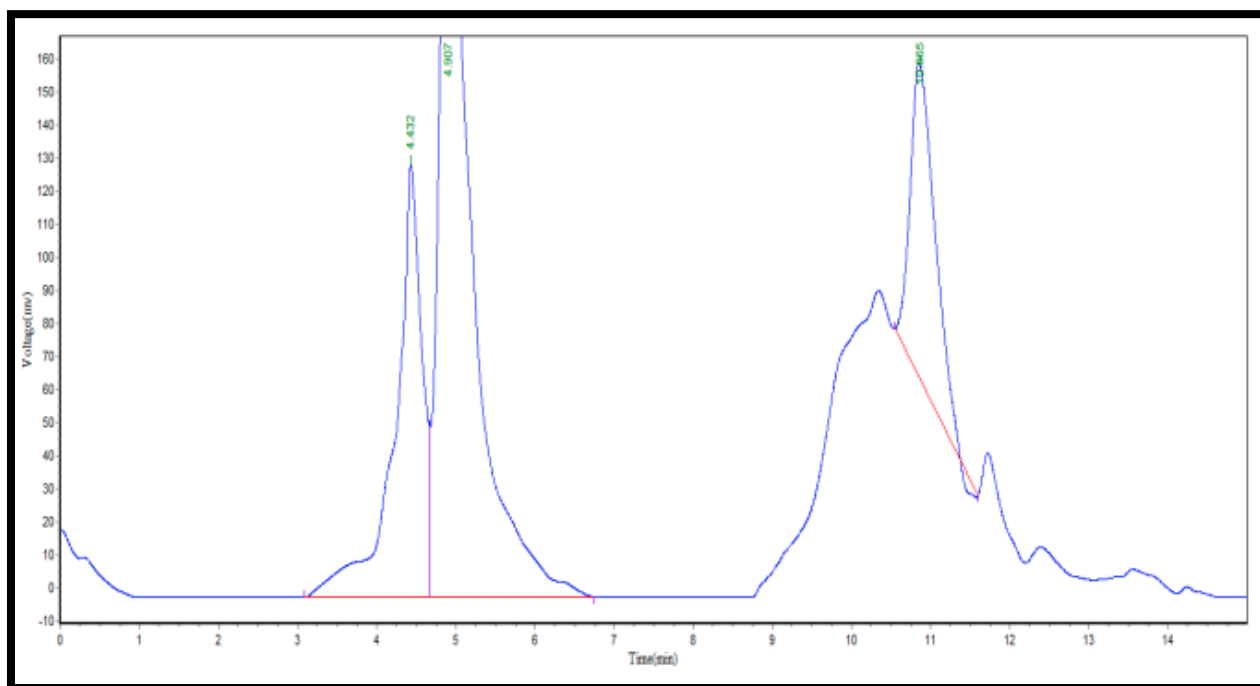


Figure 8 Moringa Flower Hexane extract Chromatogram

Conclusion –

The moringa flower extract for above mentioned solvent showed significant result from analytical point. This method can employed for analytical validation and formulation of nano herbal products. Moringa flowers can show promising pharmacological activity. Standardization of the extract has to be done before the formulation.

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