International Journal of Scientific Research in Science and Technology
Available online at : www.ijsrst.com
OPEN ACCESS
Print ISSN: 2395-6011 | Online ISSN: 2395-602X
doi : https://doi.org/10.32628/IJSRST52411289

Analysis of Poisonous Seeds and plants by Thin Layer Chromatography-Review

Shruti Shendkar, Pratima Salunkhe
Department of forensic science, Yashwantrao Chavan Institute of Science Satara, Maharashtra, India

ARTICLEINFO

Article History:
Accepted: 20 March 2024
Published: 07 April 2024

Publication Issue :
Volume 11, Issue 2
March-April-2024
Page Number :
488-490

ABSTRACT

The forensic toxicologist faces many problems to find out various seeds used in the criminal cases. In the rural area's mainly farmers use poisonous seeds to commit suicide and to find analysis of that seed is very difficult task to forensic toxicologist. And the easiest method to find is Thin Layer Chromatography. This technique helps to forensic toxicologist to solve any criminal cases of toxicology. The main purpose in the thin layer chromatography is to find the RF' value and analyses the content by various solvent systems. By analyzing the seeds which we find at crime scene and thin layer chromatography is performed to give the results. The solvent system is found and Rf valve of the sample is found in this overall review. This review has made the forensic toxicologist the easiest task to solve any criminal activities related to crime in the criminal proceedings.

Keywords : Criminal Cases, Seeds, Forensic Toxicologist, Poisonous Seeds, Chromatography.

I. INTRODUCTION

By the technique, of TLC the plant poisoning has been a common issue since ancient times with knowledge of poisonous plants dating back to human civilization. In many countries plants are used as a means to commit assault homicide, or suicide. Plants contain alkaloids glycosides, terpenes, essential oils, acids, peptides, proteins gums, resins, or tannis. However, seeds of poisonous and non-poisonous plants resemble each other Advances in chromatographic techniques (HPLC and GC) have been used to identify physical and chemical characteristics of plant poison precise identification and quantification are crucial in forensic toxicology cases. By tackling, with forty solvent systems four mainly seeds were analyzed. [1]

Herbal medicines including plants and herbs, have a long history of use in Ayurveda and have been used by 80% of world population for primary health care. These medicines are made from renewable resources and have better compatibility with human body due to their chemical constituents. By using the 'shading' the impurities can be removed. [2] Forensic science is a crucial field that investigates the dangerous certain

plants and their seeds which are essential for various health problems, have poisonous properties due to their presence in floral area, such a plant can cause severe health injuries and even death to humans. Around poisonous plant species have been reported from India, and these plants can result in accidental injuries. some toxic plant seeds have been used in crimes. In the chromatographic analysis of toxic seeds for forensic aid the study was done to identify toxic plant seeds from those pets posing a threat to health and welfare of livestock in Haryana. These results can help to forensic toxicologists' analysis Solving cases of poisoning due to plant seeds. [3]

Carissa Bispinosa, Ficus sycomous and Grewia bicolor are edible fruit plants. A study isolated flavonoids from Fruits using thin layer chromatography. Results showed that all flavonoids which are extracted had significant antioxidant activity of 80% at concentration of 200 mg/L. In the paper TLC separation and antioxidant activity of flavonoids from Carissa bispinosa Ficus sycomorus and Grewia bicolor fruit the analytical TLC of fruits was done. [4]

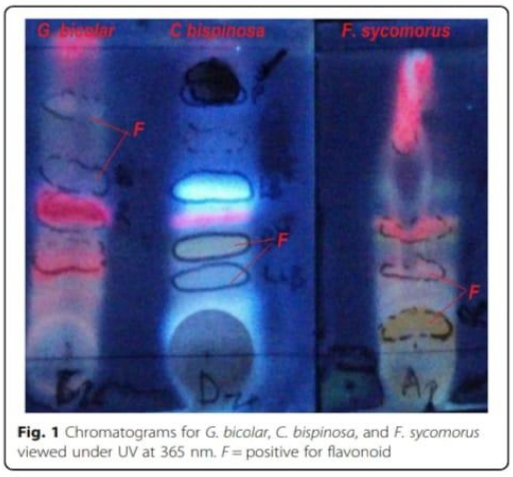

Fig. 1 Chromatograms for *G. bicolar*, *C. bispinosa*, and *F. sycomorus* viewed under UV at 365 nm. *F* = positive for flavonoid

Figure 1 (taken from [4])

Strychnine and brucine are main alkaloids from Indian strychnos plants, which are misused. Thin layer chromatography is the most preferred method for screening various poisons. The reagents like Dragendorff and Lodi platinate used for the detection of drugs, nux vomica seeds or any other biological sample. The Nexium oleander, by the (HPTLC) is used to defect glycosides. The method of the chloroform extraction from aerial parts and autopsy samples. The separation and detection are studied by the new mobile phases and spray reagents. [5] The forensic Botany can help the forensic expert to identify locations, crime types, suspect or victims in the investigation. Datura stramonium" the major plant in the region of Bundelkhand was identified by the microscopic examination and thin layer chromatographic techniques. By the Qualitative analysis of Thin Layer chromatography, the Datura stramonium was extracted. [6]

The study of analysis of phytochemical and antibacterial properties of ethanolic extract from Datura stramonium toxic plant was also extracted by technique t TLC This technique identified the qualitative alkaloids like atropine and scopolamine.

Figure 2. Chromatogram of *Datura stramonium* extract plate in visible light

Figure 2 (taken from [6])

II. METHODS AND MATERIAL

Thin layer chromatography is a technique which is used isolate any mixture. The poisonous seeds or plants can be detected by the easiest technique thin layer Chromatography. The seeds can be identified by performing the TLC technique. In this technique readymade plates are used. If the sample is solid it is dissolved in organic solvents by using the capillary

tube extract is spotted on the precoated TLC plate. Spotting is done by the 10 cm after drying TLC plate remove.

For the preparation of TLC plate follow the following steps.

Step 1- Prepare a TLC by marking baseline at bottom of the Chromatography.

Step 2- Prepare a sample and place on the TLC plate in a suitable solvent.

Step 3- The solvent will move towards upward by carrying capillary actions on the compound of the sample present.

Step 4- Visualize the results by UV light or chemical staining to see the separated compounds.

Step 5- Measure and analyze the distance travelled by a solvent and compound spotted from baseline

Step 6- Calculate RF values of Compounds.

III.CONCLUSION

Poisonous seeds which can cause a death to the person can be extracted by the easiest and well-known technique, that is thin layer chromatography. By performing famous solvent systems and finding its RF value is done in this overall paper.

IV.AKNOWLEDGEMENT

I really want to thanks first of all to our college Yashwantrao Chavan. Institute of science, Satara. For giving me such a great opportunity to do this review paper. we would like to thanks to our Head of Department of forensic science Mr. Vikram Hankare sir and our guide miss. Pratima Salunkhe mam for guiding me in every problem during reviewing this paper.

V. REFERENCES

[1]. R. S. S. Rajinder Singh, "Thin layer chromatographic analysis of some commonly used poisonous seeds," Journal of Indian Society of Toxicology, p. 4, 2006.

[2]. K. S. V. J. B. Y. Z. S. K. J. S. Poorti Mohindroo, "A rapid pesticide detection approach in food forensics using hyphenated technology of TLC-electronic nose," Food and Humanity, p. 11, 2023.

[3]. S. T. Y. S. a. R. M. T. Vimukti Chauhan, "Method development for determination ofresidual Chlorpyrifos in the grapes by Tlc-fid," Egyptian Journal of Forensic Sciences, p. 7, 2017.

[4]. P. D. a. M. Luke Gwatidzo, "TLC separation and antioxidant activity of flavonoids from Carissa bispinosa,Ficus sycomorus, and Grewia bicolar fruits," p. 7, 2018.

[5]. A. D. S. J. D. Mali Bhagwat D., "Separation and Detection of Nux Vomika Alkaloids by Thin-Layer," Journal of Forensic Chemistry and Toxicology, p. 3, 2017.

[6]. G. M.-G. ,. V. Praveen US, "Detection of Residues of Cardenolides of Nerium oleander by High-Performance Thin-Layer Chromatography in Autopsy Samples," Journal of Forensic Chemistry and Toxicology, p. 9, 2017.

[7]. A. S. S. Baljeet Yadav, "Study of Toxin 'Ricinine' present in Ricinus communis by TLC and GC-MS AForensic Perspective," Research Journal of Pharmacy and Technology , p. 7, 2022.

[8]. D.-V. D. F. B. C. M. D. a. N.-K. Rahela Carpa, "Bio-chemical analysis of Datura stramonium extract," p. 16, 2017.

[9]. A. R. M. B. N T PRAMATHESH MISHRA, "STANDARDISATION OF SEMECARPUS ANACARDIUM USING TLC TECHNIQUE," Science, Technology and Development, p. 14, 2020.

[10]. S. B. Y. S. Kiran Kumari, "Chromatographic analysis of few toxic plant seeds for forensic aid," Journal of Punjab Academy of Forensic Medicine and Toxicology , p. 6, 2018.