

# Spectrophotometric Determination of Iron in Siddha Formulation Tapyadi Lauha

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**Abstract:** The objective of this study was to chemically evaluate the popular Siddha formulation “Tapyadi Lauha” by determining the total iron content using spectrophotometric method. The standard stock solution of iron was prepared using ferric ammonium sulphate. It was then diluted to give 0.1, 0.2, 0.3, 0.4 & 0.5mg/ml respectively. After 15-20 minutes, the absorbance was noted at 515nm. The standard curve of concentration Vs absorbance was plotted. The Tapyadi Lauha was incinerated to ash. The ashes obtained were acidified with 50ml of 6N HCl and dissolved in distilled water to prepare sample solution. The absorbance was noted at 515nm. From the absorbance, the corresponding concentration was determined by extrapolation of calibration curve. Thus, the total iron content of Tapyadi Lauha was found to be as 0.410mg/ml. Hence, the data from this study suggested that the spectrophotometric method was rapid, reliable and accurate for the estimation of iron content. Hence, this method can be used for the determination of total iron content of related Siddha formulation useful in the treatment of iron deficiency anemia.

**Keywords:** Tapyadi Lauha, UV spectrophotometer, Total iron content.

## INTRODUCTION:

Iron was necessary for elementary metabolic processes in the cell<sup>1</sup>. Iron deficiency anemia was the most common type and its treatment in the Siddha system of medicine by administering Tapyadi Lauha orally was gaining popularity. Literature survey revealed that this formulation was scientifically underexplored. Hence, it was thought worth to chemically evaluate this formulation<sup>2</sup>.

## MATERIALS AND METHODS:

Tapyadi Lauha, a product of IMPCOPS, is a Siddha formulation was purchased from IMPCOPS, Pondicherry, India. Five concentrations (0.1 mg/mL to 0.5 mg/mL) of Tapyadi Lauha were prepared for spectrophotometric determination.

## EXPERIMENTAL METHOD<sup>3-4</sup>:

### Preparation of standard solution:

0.216g of ferric ammonium sulphate was dissolved in distilled water containing 10ml of concentrated hydrochloric acid and the volume was made up to 250ml with distilled water<sup>3</sup>. From this stock solution 1, 2, 3, 4 & 5ml was pipette out into 5 different 50ml volumetric flask and 5ml of 10% aq. hydroxyl ammonium chloride solution was added and the pH was adjusted between 3 to 5 using 2M sodium acetate buffer solution and 4ml of 1, 10-phenanthroline was added and finally the volume was made up to 50ml with distilled water. After 15-20 min. the absorbance was noted at 515nm. The standard curve of concentration Vs absorbance was plotted.

**Preparation of sample solution:**

Sufficient amount of Tapyadi Lauha tablet was incinerated in furnace. 0.21g of ash was taken with 50ml of 6N hydrochloric acid and boiled for 2-3 min. Then it was filtered and the volume was made up to 250ml with distilled water<sup>4</sup>. From this 5ml of solution was pipette out into 50ml volumetric flask and the same procedure was followed as in the preparation of standard solution. After 15-20 min. the absorbance was noted at 515nm. From the absorbance the corresponding concentration was determined by extrapolation of calibration curve.

**RESULTS AND DISCUSSION:**

The different concentrations of standard solution were prepared and the absorbance was noted

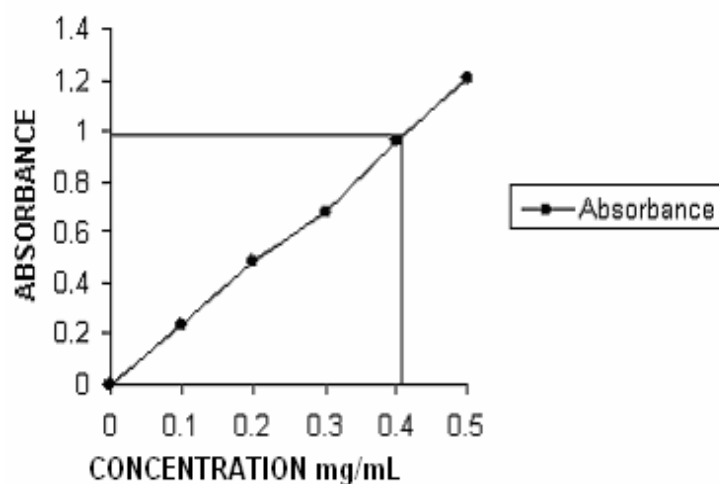
for the preparation of standard curve in Table 1. The concentration of iron in the sample solution was determined from the standard curve by extrapolation is given in Graph I. Thus, the total iron content in Tapyadi Lauha tablet was found to be as **0.410mg/ml**.

**CONCLUSION:**

The data from this study suggested that the spectrophotometric method was rapid, reliable and accurate for the estimation of iron content. Hence, this method can be used for the determination of total iron content of the Siddha formulation Tapyadi Lauha tablets.

**TABLE 1: STANDARD CURVE FOR IRON CONTENT IN TAPYADI LAUHA**

| Sl.No | Concentration (mg/mL) | Absorbance |
|-------|-----------------------|------------|
| 1.    | 0.1                   | 0.241      |
| 2.    | 0.2                   | 0.484      |
| 3.    | 0.3                   | 0.650      |
| 4.    | 0.4                   | 0.963      |
| 5.    | 0.5                   | 1.207      |
| 6.    | Sample (0.410 mg/mL)  | 0.982      |

**GRAPH I: STANDARD CURVE****STANDARD CURVE**

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