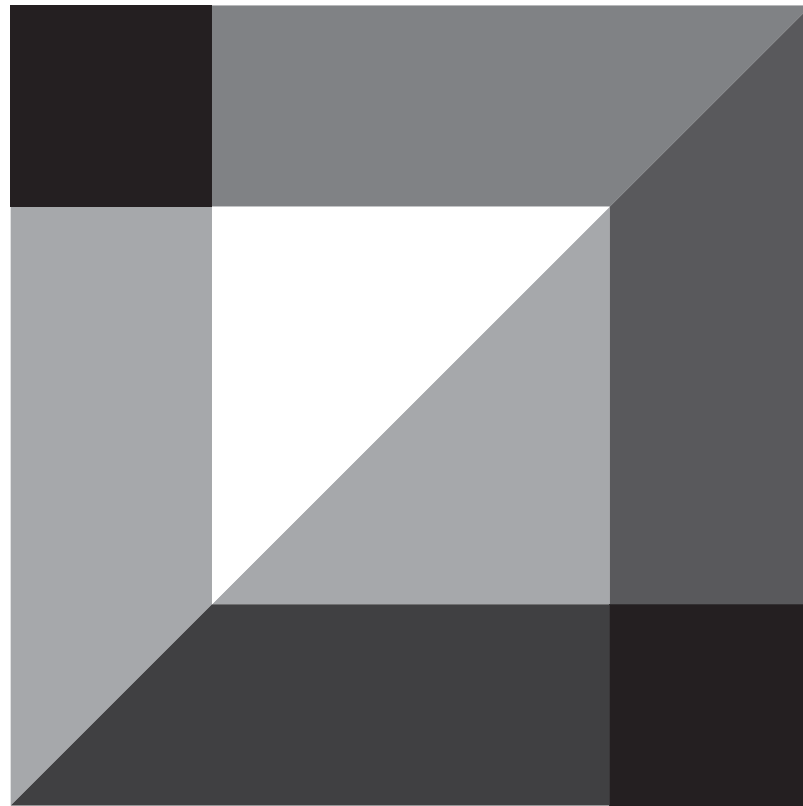


# COLOUR ANALOGY OF MITHILA PAINTING THE REALM OF ART



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## ABSTRACT

Mithila art is the traditional wall decoration art form originating from the centuries-old Mithila kingdom. It consists of vivid colours, repeating patterns, exaggerated side profiles, floral patterns, birds, animals and other mythological figures. The aim of this paper is to find out the percentage and hues of colours used in different types of Mithila paintings to understand its colour analogy – composition and variation of hues. The paper also includes information about different types of Mithila painting, their elements and the various sources of organic colours used. The Hex colour code has been identified using Photoshop. The GIMP tool is used for calculating the percentage of colours in paintings. The study shows that Mithila paintings uses more of bright colours where primary colours are comparatively more than the amount of secondary colours and have a balanced use of cool, warm and natural colours.

**Keywords:** Mithila paintings, Primary Colours, Secondary Colours, Colour Analogy.

## 1. INTRODUCTION

Women in Mithila, a region around the border of Bihar and Nepal, have been making ritualistic paintings for centuries, reflecting their social world through them (Pande, 2016). They developed floor and wall paintings locally known as *aripana* and *bhittichitra* respectively. These were made on a number of occasions such as the Vedic ceremonies of *yagyopavita* (sacred-thread ceremony) and *vivaha* (marriage) (Rekha, 2011). Folklore says this art form started in the era of *Ramayana* on the occasion of the marriage of Ram and Sita for the decoration of walls. Mithila paintings from that time till now have been used as wall decoration in Mithilanchal within the communities. These paintings were created inside Maithil (residents of Mithilanchal) houses and remained unknown to the outside world until 1934, when a British civil servant W.G. Archer found them during the inspection after a massive earthquake hit Bihar and Nepal region (Oberoi, 2012). After Archer published his work, many scholars, administrators and art lovers published several literatures about the history, elements, colours, artists, etc. of Mithila paintings. However, rarely were any studies conducted regarding percentages and use of different hues of colours used in this style of paintings. The aim of this paper is to address this and find out about the percentage and hues of colours used in different types of Mithila paintings to understand its colour analogy.

## 2. LITERATURE REVIEW

### 2.1 Location of Mithilanchal

Mithila, also known as Videha, Tirhut, Tirbhukti or Tairbhukti (Mishra, 2002) is a cultural region rather than a distinct geographical entity (Rekha, 2010). Currently, it covers the North Bihar districts of Darbhanga, Madhubani, Bhagalpur, Saharsa, and Purnea, as well as some districts in Nepal's Terai area (ibid.). Hamilton (1820) had remarked that the Tirhut district is located in the north-western region of Bahar province (now Bihar state) primarily between the latitude of 27 and 28°N. It is bordered on the north by Nepal's Saptari forest region, on the south by the great Ganges, on the east by the Purneah district of Bengal (in present-day Bihar) and on the west by the district of Sarun. Geographically, Mithila is considered between 25°28' to 26°52' N and 84°56' to 86°46' E (ASI, 1906).

### 2.2 The Art of Mithila

Mithila painting depicts Hindu mythological images using bright colours combined with fingers, nibs, brushes, and twigs. This art form is divided into unique styles, each with its own characteristics. Aishwarya (2021) has identified five types of Mithila paintings These are :

- a) *Bharni*- This style originated from the *Brahman* community which means 'filling' in Hindi. It refers to colourful and detailed painting style. Traditionally, this art genre was developed to depict Hindu deities and their historical contributions to Indian mythology.
- b) *Kachni*- This style originated with the Kayastha community and has a distinct style. Linework in the painting is made utilizing a monochromatic or a two-colour palette. Animals, flowers, and other natural elements are frequently seen in these paintings.
- c) *Godna*- Literally meaning "tattoo", this style has been around for a long time. Chanu Devi is mostly credited for introducing it. Repetitive patterns are organised in parallel lines, concentric circles or rectangles to make diverse patterns in this style. The images are mostly drawn in black, however some are coloured (Kumari, 2020). These paintings were started with the depiction of central characters of folklore, mainly Raja Salhes, Motiram, Budheshwar, Dauna Malin, Reshma-Kusma, Chuhdahal etc. (ICH Bihar, 2020).
- d) *Tantrik*- Paintings in the Tantrik style are particularly distinctive, representing traditional and religious texts in a very identical way. This style includes manifestations of Tantrik emblems such as Maha Kali, Maha Durga, Maha Lakshmi, etc (PaintandPaintings, 2020).
- e) *Kohbar*-This style predominantly depicts Hindu wedding festivities and is largely created on the internal walls of the Kohbarghar (the honeymoon room of newly-wed couples) of the house (Thakur, 2003).

### 2.3. Sources of Colour

In order to understand the sources of different colours used in Mithila paintings, Amit Kr. Jha was interviewed (2021). over a visit during October 2021. one of the famous artists (National Merit Certificate in 2016 and Indian National Trust for Art and Cultural Heritage (INTACH), Martand Singh Memorial Award in 2019) residing in Jitwarpur village, which is the hub of Mithila paintings in the Madhubani district Some of the sources of colours used in Mithila Painting were identified by him. The organic sources are:

- ▶ **Green- Organically derived from :**
  - a. Malabar spinach (poro saag); binomial name- *Basella alba*
  - b. Corn leaves (bhutte ka patta); binomial name- *Zea mays*
- ▶ **Brown- Organically derived from :**
  - a. Pipal bark (pipal ka chhal); binomial name- *Ficus religiosa*
  - b. Catechu (kattha); binomial name- *Senegalia catechu*



Figure 1: Pixelating the image using Photoshop tool (free trial version by Adobe Inc.) (Source: Author)



Figure 2: Pixel count using GIMP (Open-source software, www.gimp.org) (Source: Author)

- ▶ **Black-** Organically derived from :
  - a. Kajal (kohl)
  - b. Rice husk ash
- ▶ **Orange-** Organically derived from :
  - a. Night-flowering jasmine (parijat phool); binomial name- *Nyctanthes arbortristis*
- ▶ **Yellow-** Organically derived from :
  - a. Turmeric (haldi); binomial name- *Curcuma longa*
- ▶ **Red-** Organically derived from :
  - a. Achiote (sindoor); binomial name- *Bixa Orellana*
- ▶ **Blue-** Organically derived from :
  - a. Asian pigeonwings (aparajita phool); binomial name- *Clitoria ternatea*

### 3. METHODOLOGY

The methodology followed for conducting this research is divided into five steps :

Step 1) Firstly, the background and the types of Mithila painting were studied followed by selecting one hundred images of distinct types of Mithila paintings for the analysis.

Step 2) These were further grouped into two groups based on the number of colours present (over a white background), where the first group of fifty paintings consisted of seven colours (red, orange, yellow, blue, green, brown and black) and the other group of fifty paintings had only two colours (red and black).

Step 3) Photoshop (free trial version by Adobe Inc.) as a tool was used for the identification of different hues of colours as hex colour code and for pixelating the images of paintings. GNU Image Manipulation Program (GIMP), an open source software from www.gimp.org had been used for the counting the pixels of different colours present in a painting.

Step 4) The percentage of each colour present in the paintings were calculated manually.

Step 5) Findings are shown as forms of tables and pie charts.

### 4. ANALYSIS AND FINDINGS

#### 3.1 Analysis of paintings for calculation of percentage

The analysis has been done by calculating the percentage

distribution of various colours in paintings. For these different hues of a colour are combined as one colour for simplifying the process. This analysis is shown in the following three steps:

Step 1 : The images were then pixelated to 4 Pixels/ Centimetre (for simplification of calculation) by using Photoshop tool as shown in Figure 1.

Step 2 : The number of pixels for each colour present in the image were counted using GIMP, as shown in Figure 2.

Step 3 : After getting the number of pixels for each colour, the percentage of each colour was calculated (shown in Table 1).

This procedure was followed uniformly for all paintings of both groups. Findings from analysis of first group (7-colours) are shown in Table 2, and the percentage of cool, warm, neutral, primary and secondary colours were calculated in the paintings shown in Table 3. Similarly, the analysis of second group (2-colours) is shown in Table 4.

#### 3.2 Analysis for Different Hues of Colours

In this analysis different hues of colours have been identified as hex colour code using photoshop tool as shown in Figures 3 and 4 for the colour red. A similar process has been followed for the rest of the colours. After this, the percentage area of painting taken up by the specific hue has been calculated and the percentage number of paintings having the specific hue also has been calculated (shown in Tables 4 and 5).

### 5. DISCUSSION

For the analyses of different hues of colours present in Mithila paintings is studied respectively for seven-coloured samples and two-coloured samples.

In seven-coloured samples, it is observed that :

- **For Red category :**
  - Antique Ruby Red (#862425) which is made out of achiote (sindoor), binomial name- *Bixa orellana*, covers the maximum percentage area (see Table 5(a) and Figure 6).
  - Magic Potion Red (#f8465c), made out of fabric dyes is the most repetitive hue (see Table 5(a) and Figure 5).

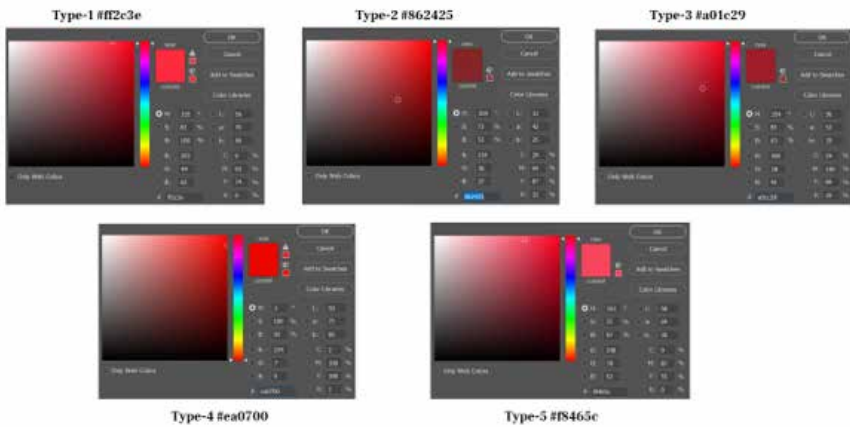


Figure 3: Hues of colour red in seven-coloured paintings  
(Source: Author)

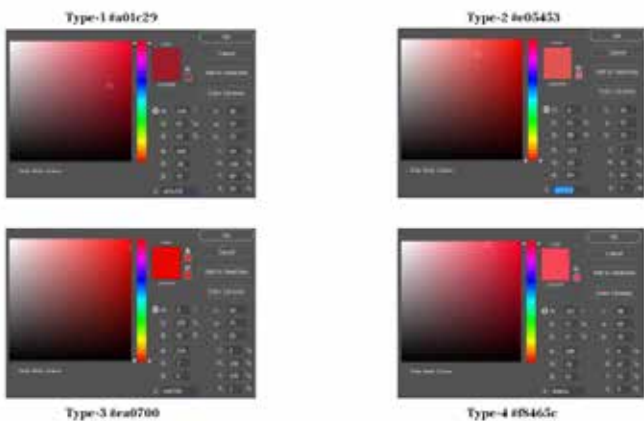


Figure 4: Hues of colour red in two-coloured paintings  
(Source: Author)

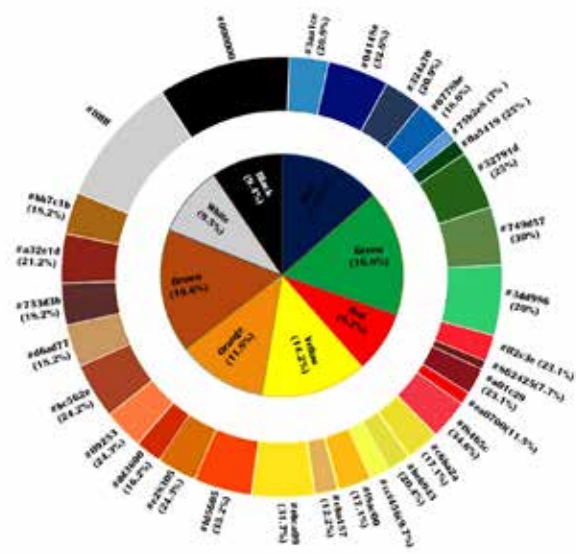


Figure 5: Percentage number of paintings having the specific hue in seven-coloured paintings  
(Source: Author)

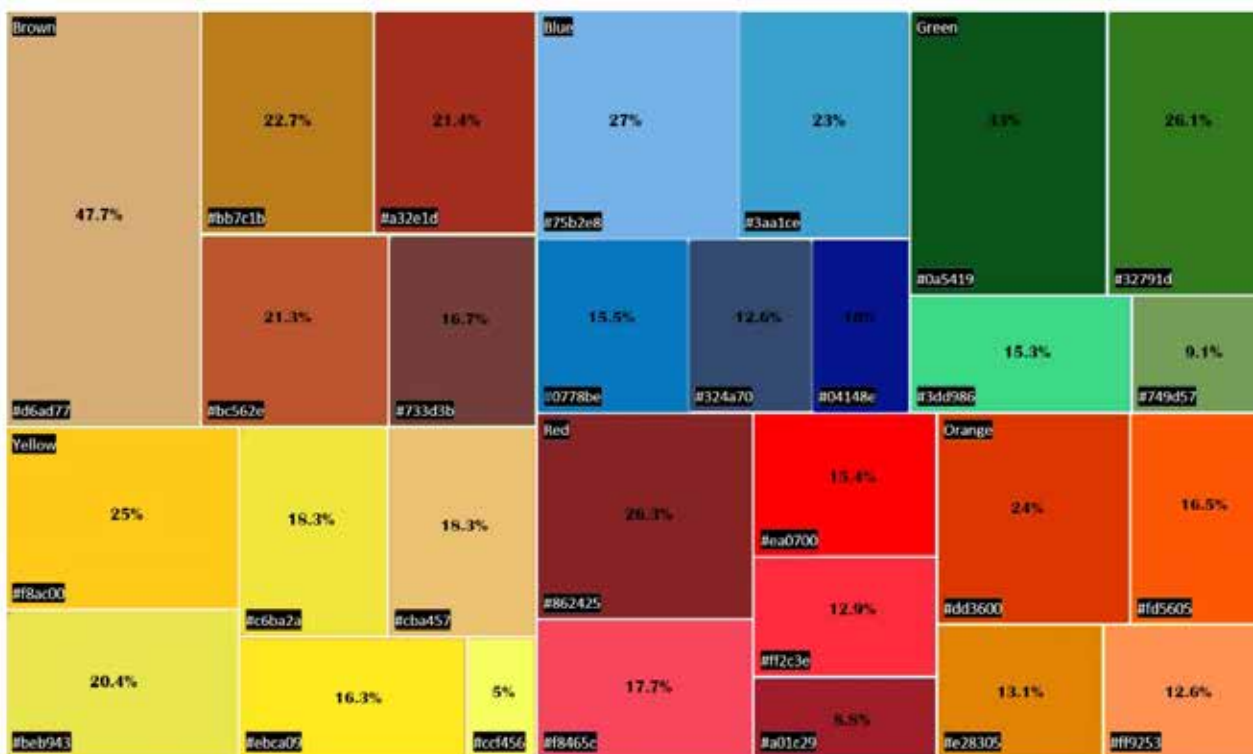


Figure 6: Percentage area of painting taken up by the specific hue in seven-coloured paintings  
(Source: Author)

- **For Yellow category :**
  - Old Gold Yellow (#862425) covers the maximum percentage area (see Table 5(b) and Figure 6)
  - Citrine Yellow (#ebca09), made out of turmeric is the most repetitive hue (see Table 5(b) and Figure 5).
- **For Blue category :**
  - Aero Blue (#75b2e8) which is similar to the colour of nemophila flower (baby blue eyes), covers the maximum percentage area (see Table 5© and Figure 6).
  - Phthalo Blue (#04148e), made out of Asian pigeonwings flowers (aparajit phool); binomial name- *Clitoria ternatea* is the most repetitive hue (see Table 5© and Figure 5).
- **For Green category :**
  - Forest Green (Traditional) (#0a5419) which is made out of corn-leaves (bhutte ka patta); binomial name- *Zea mays*, covers the maximum percentage area (see Table 5(e) and Figure 6).
  - Moss Green (#749d57), made out of grasses is the most repetitive hue (see Table 5(e) and Figure 5).
- **For Brown category :**
  - Light French Beige Brown (#d6ad77) which is made out of peepal bark (pipal ka chhal); binomial name- *Ficus religiosa*, covers the maximum percentage area (see Table 5(f) and Figure 6).
  - Ruddy Brown (#bc562e), made out of catechu (kattha); binomial name- *Senegalia catechu* is the most repetitive hue (see Table 5(f) and Figure 5).

Similarly in two-coloured samples :

- Electric Red (#ea0700) which is made out of alta dyes,

covers the maximum percentage area (see Table 4).  
- Vivid Burgundy Red (#a01c29), which is also a variant of the colour of sindoor is the most repetitive hue (see Table 4).

## 6. CONCLUSION & RECOMMENDATIONS

Mithila paintings are seen to use more primary colours as compared to secondary colours. There is a balanced use of cool, warm and natural colours. The most-used colours are often bright colours made from natural sources such as rocks, vermilion, leaves, flower petals, etc. In seven-coloured Mithila paintings, orange, yellow, green and brown are comparatively more used than blue, red, black and white. Two-coloured Mithila paintings have approximately equal amounts of black and white which cover approximately three-fourths of the painting together. In two-coloured paintings, the colour red covers approximately one-fourth of the composition.

There are various examples of paintings being utilised as inspiration for the colours and forms used in contemporary design, such as the *Red and Blue Chair* and *Schroder House* by Ar. Gerrit Rietveld and *Eames House* by Charles and Ray Eames was inspired from the Piet Mondrian's iconic *De Stijl* painting. Le Corbusier's colour palette was also influenced by Pablo Picasso's colours, which can be seen in several of his works, including the *Corbusier Pavilion* in Zurich.

This study is unique in the Indian context, and it can be used as a source of colour inspiration in architecture. The use of colours in buildings, their aesthetic appreciation may have a psychological anchorage to the age-old traditional paintings done on the walls of buildings in Mithilanchal. This may be an arena of further research.

Table 1: Calculation of Percentage (The pixel count was retrieved from GIMP)

(Source: Author)

Colours	No. of Pixels	Percentage
1. Blue	0689	6.5%
2. Green	2340	22.1%
3. Red	2055	19.5%
4. Orange	1916	18.1%
5. Yellow	1462	13.8%
6. White	2117	20.0%
TOTAL	10,579	100%

Table 2: Analysis of seven-coloured paintings

(Source: Author)

	Blue %	Green %	Red %	Yellow %	Orange %	Brown %	Black %	White %
1	10	7.5	7.5	7.5	17.5	7.5	37.5	0
2	20.5	15.9	0	20.5	0	29.5	13.6	0
3	4.4	11.6	5.8	7.2	5.8	10.2	0	55
4	9.8	8.5	1.2	19.5	24.4	4.9	31.7	0
5	0	13.3	0	6.1	7.1	12.2	10.2	51
6	0	0	47.6	4.8	0	0	12	35.6

7	37.5	0	0	12.5	0	0	16.7	33.3
8	36.3	9.1	27.3	27.3	0	0	0	0
9	28.6	32.1	0	7.1	0	0	32.2	0
10	22.2	17.1	11.1	38.9	0	10.7	0	0
11	21.5	50	0	7	21.5	0	0	0
12	16	1.7	6.5	64.5	11.3	0	0	0
13	0	0	4.9	29.3	0	0	34.1	31.7
14	10.5	10.5	10.5	5.3	0	0	0	63.2
15	11.4	37.1	0	17.1	5.7	0	0	28.7
16	11.1	16.7	5.5	16.7	11.1	22.2	0	16.7
17	5.5	30.6	0	36.1	0	27.8	0	0
18	16.7	8.3	0	20.8	0	33.3	20.9	0
19	14.7	32.4	0	32.4	0	20.5	0	0
20	17.8	25	0	3.6	14.3	25	14.3	0
21	0	37.5	0	12.5	12.5	37.5	0	0
22	5	16.7	0	1.7	10	23.3	0	43.3
23	22.2	18.5	0	37	7.4	14.9	0	0
24	0	10	3	0	0	17	25	45
25	13.6	4.6	0	0	68.2	13.6	0	0
26	6.1	21.2	0	36.4	9.1	27.2	0	0
27	16.7	10	0	6.7	33.3	33.3	0	0
28	19	32.4	0	10.8	24.3	13.5	0	0
29	19	0	0	4.8	14.3	47.6	0	14.3
30	7.6	43.9	0	10.6	7.6	21.2	9.1	0
31	20.07	15	0	8.1	15.6	40.6	0	0
32	15.6	15.6	0	37.5	31.3	0	0	0
33	33.3	16.7	11.1	22.2	16.7	0	0	0
34	40.9	31.8	0	9.1	13.6	0	4.6	0
35	13.1	43.4	0	30.4	13.1	0	0	0
36	0	25	12.5	25	25	0	12.5	0
37	5	0	5	0	20	40	30	0
38	3.9	0	23.1	0	15.4	46.1	11.5	0
39	7.2	0	14.3	0	11.9	38	28.6	0
40	5.8	0	19.2	0	9.6	38.5	26.9	0
41	12	0	32	0	0	40	16	0
42	9.1	0	25	0	9.1	47.7	9.1	0
43	31.6	21.1	0	5.2	10.5	31.6	0	0
44	15.8	15.8	15.8	15.8	10.5	21	5.3	0
45	12.5	12.5	18.7	31.3	18.7	6.3	0	0
46	5.4	26.3	10.5	10.5	10.5	15.8	10.5	10.5
47	15.4	38.5	15.4	11.5	11.5	0	7.7	0
48	9.1	18.2	12.1	0	9.1	9.1	18.2	24.2
49	7.4	11.1	29.7	11.1	25.9	0	14.8	0
50	6.4	25.9	12.9	6.4	6.4	0	16.1	25.9
<b>Average</b>	<b>13.5</b>	<b>16.8</b>	<b>8.2</b>	<b>14.2</b>	<b>11.8</b>	<b>16.6</b>	<b>9.4</b>	<b>9.5</b>

**Table 3: Analysis of colours in group**

(Source: Author)

1. Cool Colours Blue, Green	Warm Colours Red, Orange, Yellow	Neutral Colours Brown, Black, White
30.3%	34.2%	35.5%
2. Primary Colours Blue, Red, Yellow	Secondary Colours Orange, Green	-
35.8%	28.7%	

**Table 4: Analysis of two-coloured paintings**

(Source: Author)

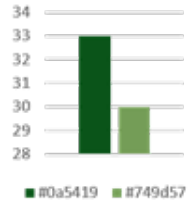
Colours	Red	Black	White		
	17.4%	46%	36.6%		
RED	Type-1 #a01c29	Type-2 #e05453	Type-3 #ea0700	Type-4 #f8465c	Hue covers most percentage area taken and most repetitive hue
Percentage area of painting taken up by the specific hue	16.6%	14.5%	21.3%	18%	
Percentage number of paintings having the specific hue	32%	30%	26%	12%	

**Table 5: Analysis of different hues of colour**

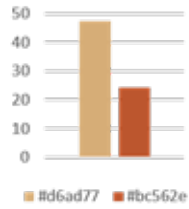
(Source: Author)

	Type-1	Type-2	Type-3	Type-4	Type-5	Type-6	Hue (covers most percentage area taken and most repetitive)
a) Red	#ff2c3e	#862425	#a01c29	#ea0700	#f8465c	-	
Percentage area of painting taken up by the specific hue	12.9%	26.3%	8.8%	15.4%	17.7%		
Percentage number of paintings having the specific hue	23.1%	7.7%	23.1%	11.5%	34.6%		
b) Yellow	#c6ba2a	#beb943	#ccf456	#f8ac00	#cba457	#ebca09	
Percentage area of painting taken up by the specific hue	18.3%	20.4%	5%	25%	18.3%	16.3%	
Percentage number of paintings having the specific hue	17.1%	12.2%	9.7%	17.1%	12.2%	31.7%	
c) Blue	#3aa1ce	#04148e	#324a70	#0778be	#75b2e8	-	
Percentage area of painting taken up by the specific hue	23%	10%	12.6%	15.5%	27%		
Percentage number of paintings having the specific hue	20.9%	32.6%	20.9%	18.6%	7%		
d) Orange	#fd5605	#e28305	#dd3600	#ff9253	-	-	
Percentage area of painting taken up by the specific hue	16.5%	13.1%	24%	12.6%			
Percentage number of paintings having the specific hue	35.2%	24.3%	16.2%	24.3%			

e) Green	#0a5419	#32791d	#749d57	#3dd986	-	-
Percentage area of painting taken up by the specific hue	33%	26.1%	9.1%	15.3%		
Percentage number of paintings having the specific hue	25%	25%	30%	20%		

f) Brown	#bc562e	#d6ad77	#733d3b	#a32e1d	#bb7c1b	-
Percentage area of painting taken up by the specific hue	21.3%	47.7%	16.7%	21.4%	22.7%	
Percentage number of paintings having the specific hue	24.2%	18.2%	18.2%	21.2%	18.2%	



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