PHYTOCHEMICAL SCREENING AND ANTIOXIDANT ACTIVITY OF EXTRACTS OF *RICINUS COMMUNIS, CARICA PAPAYA* PLANT AND MIXTURE OF *RICINUS COMMUNIS* AND *CARICA PAPAYA*

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ABSTRACT

Ricinus communis and *Carica papaya* is an important medicinal Plant found in India. The present study was aimed to evaluate the phytochemical constituents and antioxidant activity of leaf extracts of *Ricinus communis* and *Carica papaya* and mixture of *Ricinus communis* and *Carica papaya*. Antioxidant activity was carried out using 1,1-diphenyl-2-picrylhydrazyl radical (DPPH) assay method.

Index Terms: Phytochemicals, antioxidant, free radicals, *Ricinus communis* and *Carica papaya*, DPPH

I. INTRODUCTION

Erandi (*Ricinus communis* Linn.), of Euphorbiaceae family is an important drug mentioned in Ayurveda classics from Vedic period itself. It is used very commonly in rheumatic conditions, wounds, hydrocele etc.[1]. The plant considered probably a native of Africa, is found throughout the hotter parts of India and tolerates a wide range of climatic conditions[2]. While describing agryadravyas, Charaka considered Erandamoola as vrshya and vatahara[3]. *Carica papaya* is one of the most effective sources of natural medicine and widely used in pharmacological applications. It is used to treat several diseases such as tumors, nervous pain, asthma and wounds.

II. MATERIALS AND METHOD

The plant materials of *Ricinus communis* and *Carica papaya* were collected seasonally and authenticated by the taxonomists Dr. S.P. Rothe from the Department of Botany, Shri Shivaji College, Akola.

III. CHEMICALS

All the chemicals used in the study were obtained commercially and of analytical grade.

IV. PHYTOCHEMICAL SCREENING[4-8]

The chemical tests were performed for testing different chemical groups present in ethanolic and water extract of leaves of *Ricinus communis* and *Carica papaya* and mixture of leaves of *Ricinus communis* and *Carica papaya.*

Table 1: Phytochemical analysis of Test Plant *Ricinus communis* and *Carica papaya* Ethanolic and Water Extract

Sr. No.	*Phyto-constituents*	*Ricinus communis leaves extract*		*Carica papaya leaves extract*		*Mixture of Ricinus communis and Carica papaya*
		Ethanol extract	**Water extract**	**Ethanol extract**	**Water extract**	**Ethanol extract**
1.	Carbohydrates	+	+	+	+	+
2.	Reducing Sugar	+	+	+	+	+
3.	Hexose sugar					
	i) Glucose	+	+	+	+	+
	ii) Fructose	+	+	+	+	+
4.	Steroid /Triterpenoid	+	+	+	–	+
5.	Protein	+	+	+	+	+
6.	Alkaloids	+	+	+	+	+
7.	Amino acids	–	– (ninhydrine)	–	–	–
8.	Flavonoids	+	+	–	+	+
9.	Tannins	+	+	+	+	+
10.	Coumarin Glycosides	+	–	+	–	+
11.	Anthraquinone Glycosides	–	–	–	–	+
12.	Cyanogenetic Glycosides	–	+	–	–	–
13.	Cardiac Glycosides	–	–	+	–	–
14.	Saponins	–	–	–	+	–
	SPECIFIC TESTS					
15.	Barberine	+	+	+	+	+
16.	Morphine	+	+	+	+	–
17.	Aconitine	–	–	–	–	–
18.	Brucine	+	+	–	–	–
19.	Connine	+	–	–	–	+
20.	Ergometrine	+	–	–	–	+
21.	Hesperidin	+	+	–	–	–
22.	Papaverine	–	–	+	–	–
23.	Phygostigmine	–	–	+	–	–
24.	Quinine	+	+	+	+	+

25.	Quinidine	+	+	+	_	_
26.	Soalsodine	−	_	_	_	_
27.	Cinchonine	_	_	_	_	_
28.	Cinchonidine	_	_	+	+	+

V. MATERIALS AND METHODS

The Leaves of *Ricinius communis* And *Carica papaya* plants were shade dried at room temperature and ground in a manual mill to get coarse powder. The coarse powdered materials of leaves were kept in the airtight polythene bag and stored in dry place. These powders were extracted with ethanol by using soxhlet apparatus. The extracts were concentrated at 40 ^{o}C using rotary evaporator. Finally it was dried, crushed and stored in air tight bottles at 4 ^{o}C for further study.

VI. STUDY OF ANTIOXIDANT ACTIVITY BY DPPH[9-10]

The antioxidant activity of the ethanol and Water extracts of Leaves of *Ricinus communed* and *Carica papaya*, plants were assessed on the basis of the radical scavenging effect of the stable 1, 1-diphenyl-2-picrylhydrazyl (DPPH). The diluted working solutions of the test plant extracts were prepared in ethanol and water 0.004% (Ethanol) of DPPH was prepared in ethyl alcohol and 3 ml of this solution was mixed with 3 ml of sample solutions. These solution mixtures were kept in dark for 30 min and optical density was measured at 517 nm using UV Visible spectrophotometer. Alcohol (3 ml) with DPPH solution (0.004%, 3 ml) was used as blank. The optical density was recorded and % inhibition was calculated using the formula given below

$$\text{Percentage (\%) Inhibition of DPPH (\% AA)} = \frac{A - B}{A} \times 100$$

Where A=Optical density of the blank and B=Optical density of the sample.

VII. RESULTS AND DISCUSSION

The stock solution 1 mg/ml of ethanol was prepared. The required dilutions 0.1 mg/ml to 0.9 mg/ml were prepared by appropriate dilutions. The optical density and percent antioxidant activity were calculated.

Table 2: Optical density and percent antioxidant activity for *Ricinus communis* leaves ethanolic extract. O.D of blank DPPH=0.595

Conc.mg/ml	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1
O.D. of *R. communis*	0.556	0.548	0.538	0.487	0.433	0.410	0.380	0.346	0.338	0.310
%AA *R. communis*	6.55	7.89	9.57	18.15	27.22	31.09	36.13	41.84	43.19	47.89

IC_{50} =0.049mg/ml

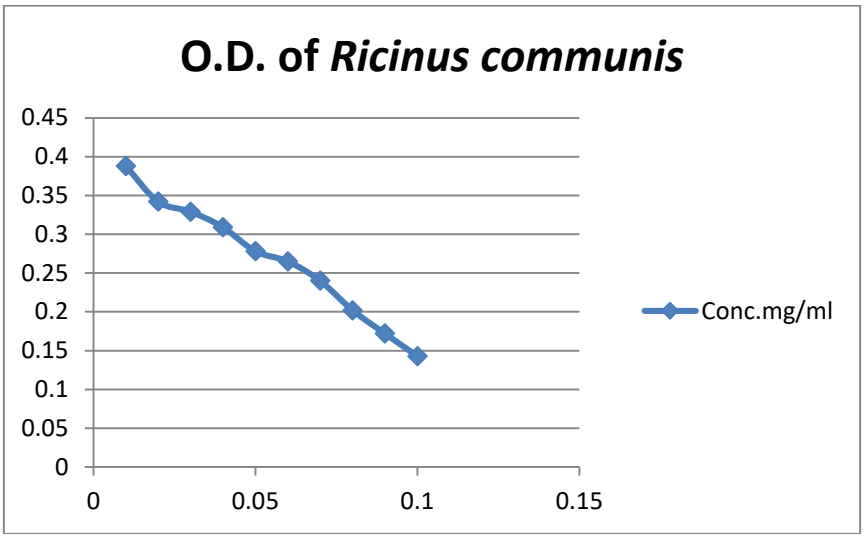

Figure 1: Decrease in optical density of sample with increase in concentration for *Ricinus communis* leaves ethanolic extract

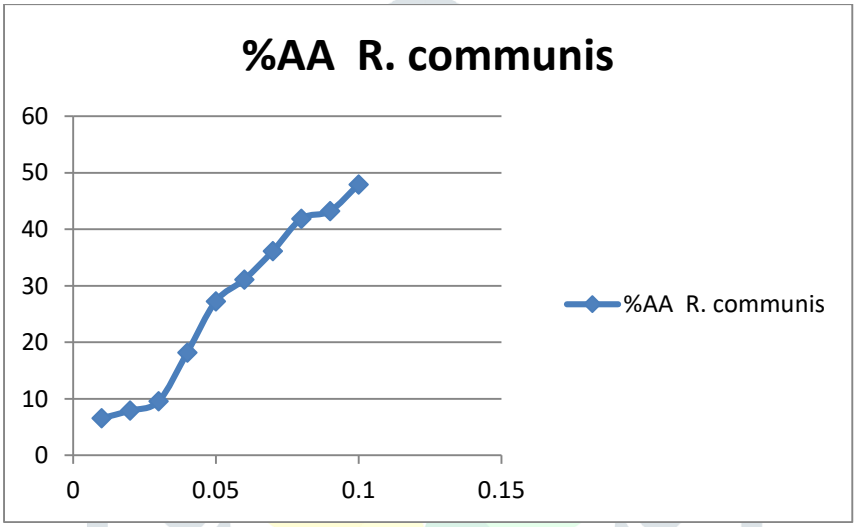

Figure 2: Increase in percent antioxidant activity with increase in concentration for *Ricinus communis* leaves ethanolic extract

Table 3 : Optical density and percent antioxidant activity for water extract of *Ricinus communis* leaves: (O.D of Blank DPPH = 0.595)

Conc.mg/ml	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1
O.D. of *Ricinus communis*	0.388	0.342	0.329	0.309	0.278	0.265	0.240	0.202	0.172	0.143
%AA *Ricinus communis*	34.78	42.52	44.70	48.06	53.27	55.46	59.66	66.05	71.09	75.96

IC_{50} = 0.061mg/ml.

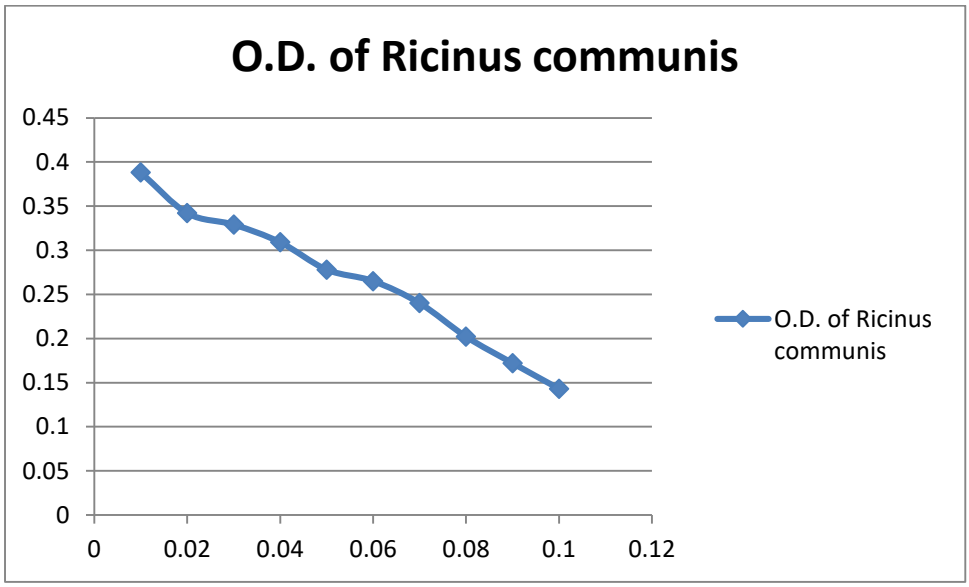

Fig.3 Decrease in optical density of sample with increase in concentration for *Ricinus communis* leaves water extract

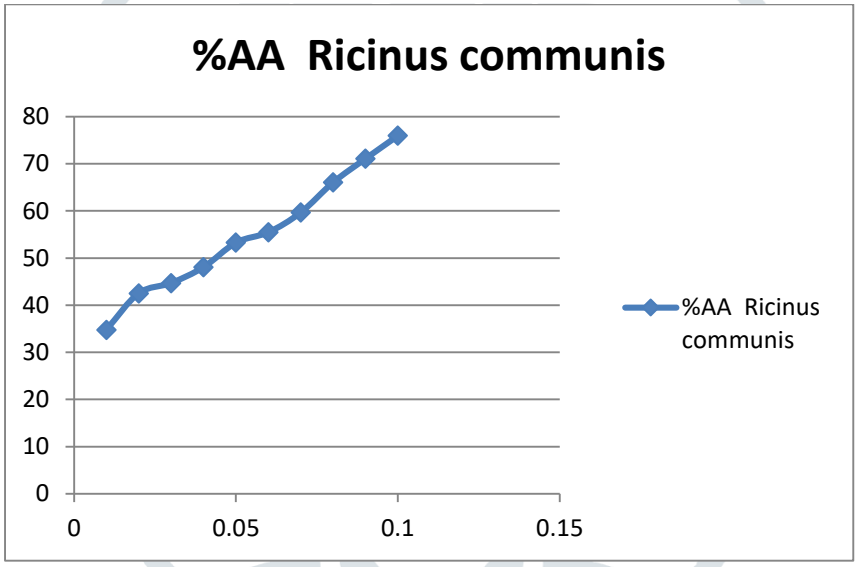

Fig. 4 : Increase in percent antioxidant activity with increase in concentration for *Ricinus communis* leaves water extract

Calculation of IC_{50} for *Ricinus communis* ethanolic leaves extract = max - ½ (max-min)

=47.89 - ½ (47.89 – 6.55)

= 47.89– 20.67

= 27.22

IC_{50} value corresponding to *Ricinus communis* ethanolic leaves extract is 0.049 mg/ml.

Calculation of IC_{50} for *Ricinus communis* water leaves extract = max - ½ (max-min)

=75.96 - ½ (75.96 – 34.78)

= 75.96 – 20.59

= 55.37

IC_{50} value corresponding to *Ricinus communis* water leaves extract is 0.061 mg/ml.

Table 4: Optical density and percent antioxidant activity for ethanolic extract of *Carica papaya* leaves : (O.D. of Black DPPH = 0.595)

Conc.mg/ml	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1
O.D. of *Carica papaya*	0.555	0.524	0.486	0.460	0.425	0.410	0.390	0.378	0.345	0.320
%AA *Carica papaya*	6.72	11.96	18.31	22.68	28.57	31.09	34.45	36.47	42.01	46.21

IC_{50} = 0.047mg/ml

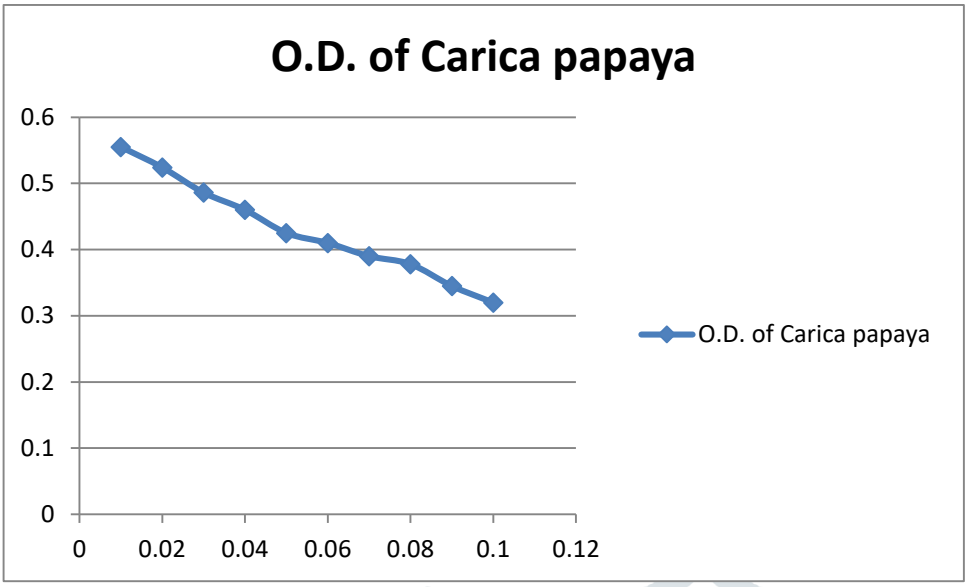

Fig 5 : Decrease in optical density of sample with increase in concentration for ethanolic exract of *Carica papaya* leaves

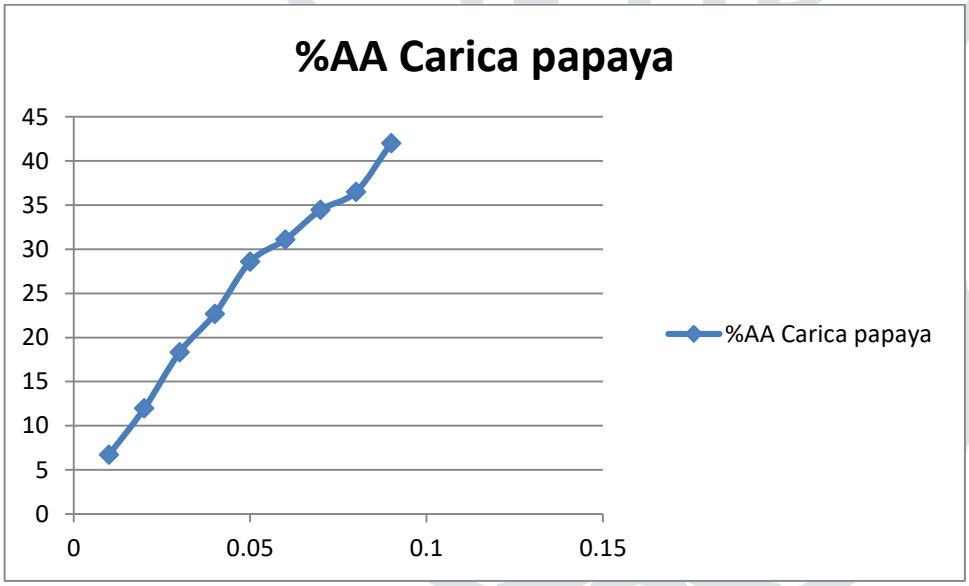

Fig 6 : Increase in percent antioxidant activity with increase in concentration for ethanolic extract of *Carica papaya* leaves

Table 5: Optical density and percent antioxidant activity for Water extract of *Carica papaya* leaves (O.D. of Black DPPH = 0.595)

Conc.mg/ml	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1
O.D. of *Carica papaya*	0.594	0.591	0.588	0.538	0.486	0.456	0.414	0.368	0.338	0.318
%AA *Carica papaya*	0.16	0.67	1.17	9.57	18.31	23.26	30.42	38.15	43.19	46.55

IC_{50} = 0.060mg/ml

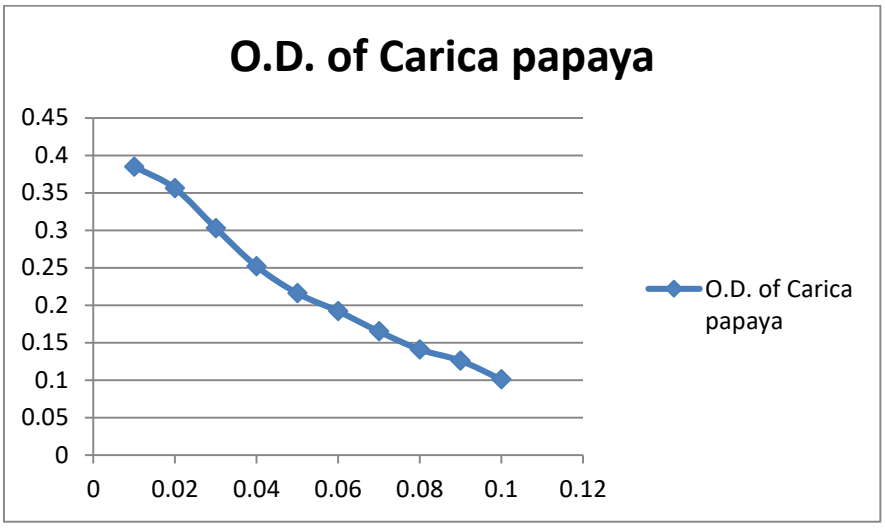

Fig 7 : Decrease in optical density of sample with increase in concentration for water extract of *Carica papaya* leaves

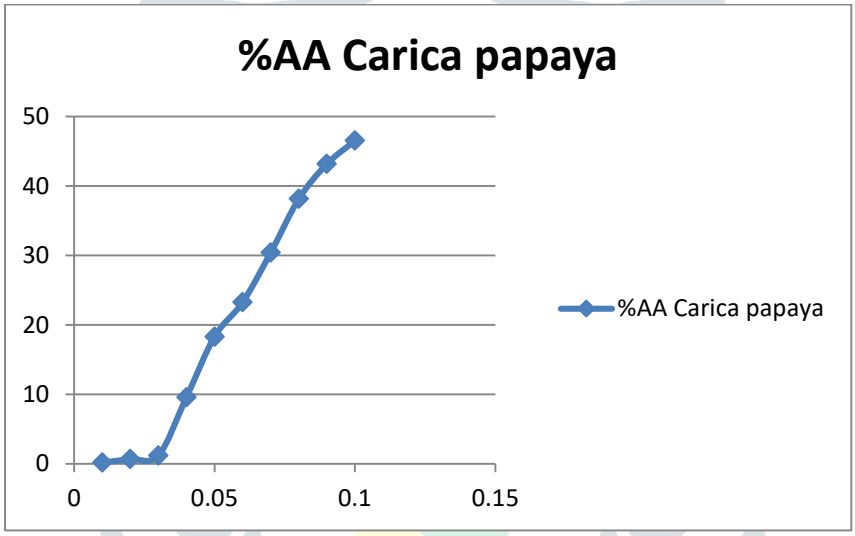

Fig. 8 : Increase in percent antioxidant activity with increase in concentration for water extract of *Carica papaya* leaves

Calculation of IC_{50} for *Carica papaya* ethanolic leaves extract = max - ½ (max-min)

=46.21 - ½ (46.21 – 6.72)

= 46.21– 19.74

= 26.47

IC_{50} value corresponding to *Carica papaya* ethanolic leaves extract is 0.047 mg/ml.

Calculation of IC_{50} for *Carica papaya* water leaves extract = max - ½ (max-min)

=46.55 - ½ (46.55 – 0.16)

= 46.55 – 23.19

= 23.36

IC_{50} value corresponding to *Carica papaya* water leaves extract is 0.060 mg/ml.

Table 6 : Optical density and percent antioxidant activity for ethanolic extract of mixture of *Ricinus communis* and *Carica papaya* (leaves) (O.D. of Black DPPH = 0.595)

Conc.mg/ml	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1
O.D. of *R.communis* + *C.papaya*	0.554	0.514	0.487	0.445	0.427	0.415	0.401	0.389	0.373	0.360
%AA *R.communis* + *C.papaya*	6.89	13.61	19.66	25.21	28.23	30.25	32.60	34.62	37.31	39.49

IC_{50} = 0.037mg/ml

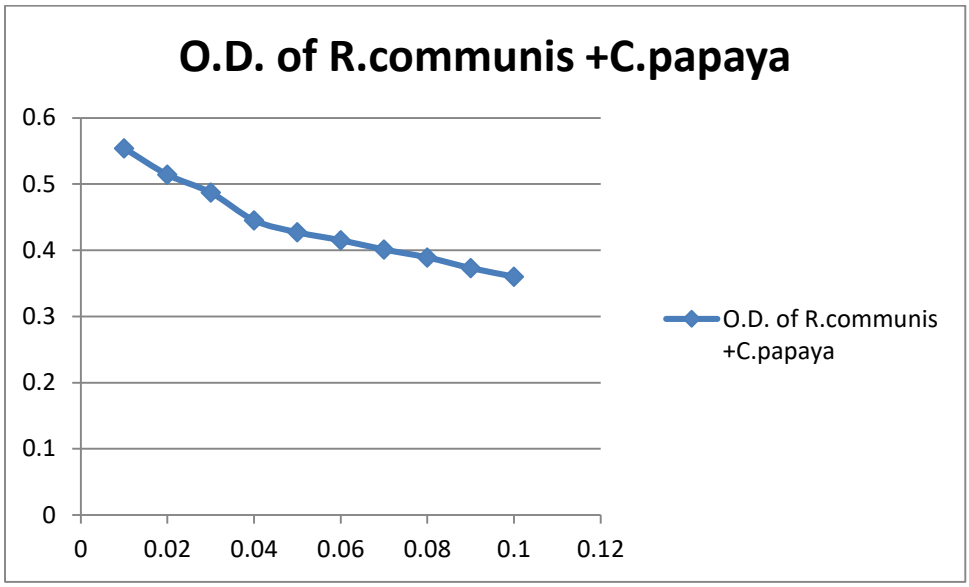

Fig 9 : Decrease in optical density of sample with increase in concentration for mixture of ehanolic extract of *Ricinus communis* and *Carica papaya* (leaves)

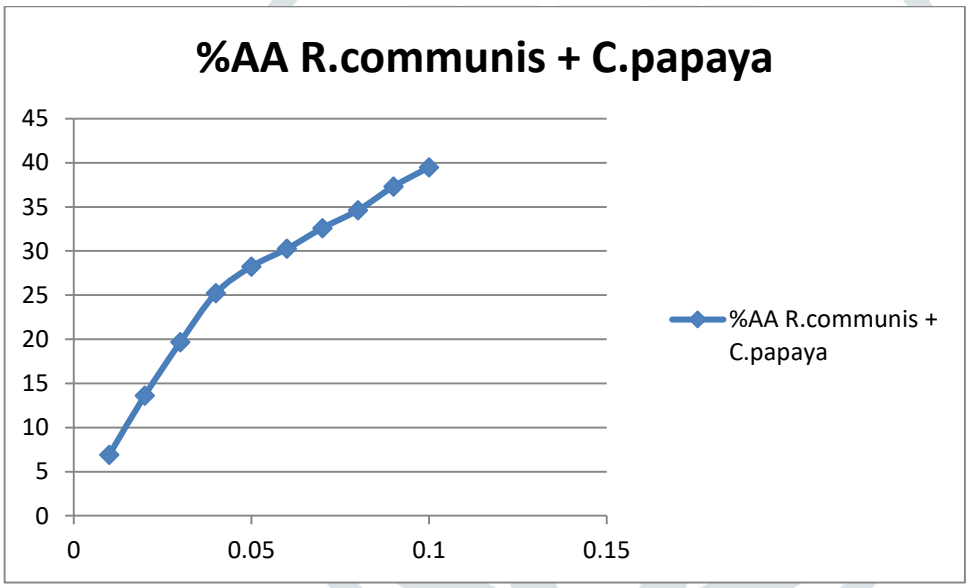

Fig 10 : Increase in percent antioxidant activity with increase in concentration for ethanolic extract of leaves

Calculation of IC_{50} for mixture of *Ricinus communis and Carica papaya* ethanolic leaves extract = max - ½ (max-min)

=39.49 - ½ (39.49 – 6.89)

= 39.49– 16.3

= 23.19

IC_{50} value corresponding to mixture of *Ricinus communis and Carica papaya* ethanolic leaves extract is 0.037 mg/ml.

VIII. CONCLUSION

From above study it is concluded that various phytochemicals were present in Ricinus communis, Carica papaya and mixture of Ricinus communis and Carica papaya leaves extract.

The remarkable decrease of O.D. value and increase in %AA with increase in concentration of extract of Ricinus communis, Carica papaya and mixture of Ricinus communis and Carica papaya is observed which show that all of them have good antioxidant activity.

IX. ACKNOWLEDGEMENT

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