





3.	Acetone	NSP 4	-ve	-ve	-ve	-ve	-ve	-ve	+ve	+ve	+ve	+ve	-ve
	Acetone	NSP 5	-ve	-ve	-ve	-ve	-ve	-ve	+ve	+ve	+ve	+ve	-ve
	Acetone	NSP 6	-ve	-ve	-ve	-ve	-ve	-ve	+ve	+ve	+ve	+ve	-ve
	Acetone	NSP35	-ve	-ve	-ve	-ve	-ve	-ve	+ve	+ve	+ve	+ve	-ve
	Acetone	NSP36	-ve	-ve	-ve	-ve	-ve	-ve	+ve	+ve	+ve	+ve	+ve
4.	Hexane	NSP 4	-ve	-ve	-ve	-ve	-ve	-ve	-ve	+ve	-ve	+ve	+ve
	Hexane	NSP 5	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	+ve	+ve
	Hexane	NSP 6	-ve	-ve	-ve	-ve	-ve	-ve	-ve	+ve	+ve	+ve	+ve
	Hexane	NSP35	-ve	-ve	-ve	-ve	-ve	-ve	-ve	+ve	-ve	+ve	+ve
	Hexane	NSP36	-ve	-ve	-ve	-ve	-ve	-ve	-ve	+ve	-ve	+ve	+ve

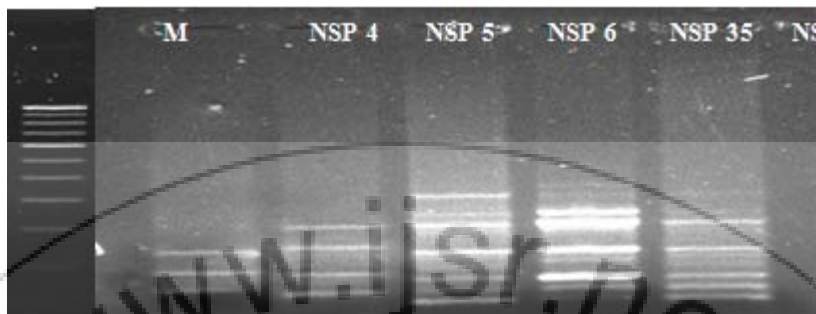
San –Saponins Fla-Flavonoids Phe-Phenol Orii-Ouinones Ter-Terpenoids Tan-Tannin Alk-Alkaloid Carb-Carbohydrate



banding pattern score was based on the presence or absence of clear, visible and reproducible bands. The results were analyzed based on the principle that a band is considered to be 'polymorphic' if it is present in some individuals and absent in others, and 'monomorphic' if present in all the individuals. In this study, both the primers produced a total of 32 and 25 bands respectively Table-3.

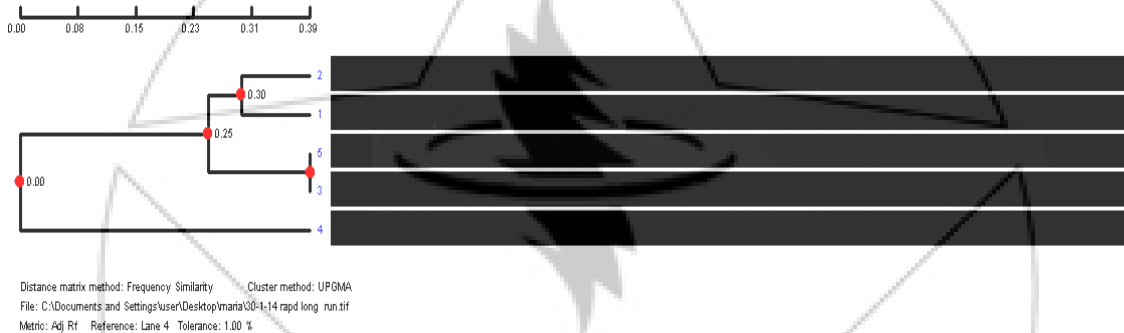
**Table 3:** Polymorphism and monomorphism

Primer	Total no. of bands	% Polymorphism	% Monomorphism	Unique Bands
OP A8	32	21.87	6.25	2
OP A9	25	24	3.84	1



**Figure 3:** Amplification using OP A8

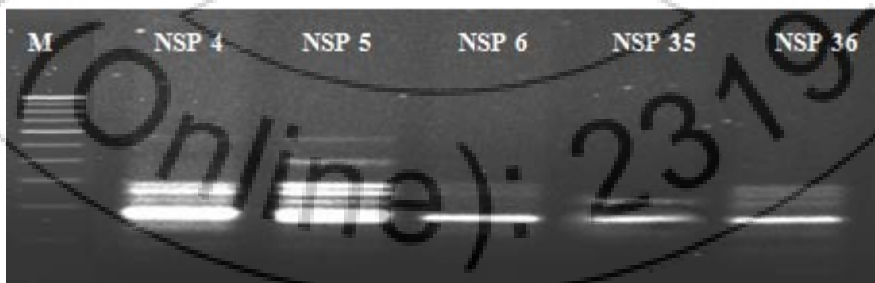
Among the bands obtained using primer OP A8, 21.87 % were polymorphic, 6.25 % were monomorphic and 2 unique bands were observed. The obtained RAPD data was further utilized for construction of dendrogram and similarity matrix Figure-4.



**Figure 4:** Dendrogram constructed by using OP A8 primer. 1 - NSP4, 2 -NSP5, 3 - NSP6, 4 - NSP35, 5 - NSP36

	1	2	3	4	5
1	100.00	81.82	72.73	9.09	72.73
2	81.82	100.00	72.73	9.09	72.73
3	72.73	72.73	100.00	36.36	100.00
4	9.09	9.09	36.36	100.00	36.36
5	72.73	72.73	100.00	36.36	100.00

The dendrogram obtained using primer OP A8 it was observed that, NSP 4 showed 81.82% similarity with NSP 5, whereas least similarity was observed between NSP 35 and NSP 4 (9 %).



**Figure 5:** Amplification using OP A9

Among the bands obtained using primer OP A9, 24 % were polymorphic, 3.84 % were monomorphic and 1 unique band was observed. The obtained RAPD data was further utilized for construction of dendrogram and similarity matrix Figure-6.



Figure 6: Dendrogram constructed by using OP A9 primer. 1 - NSP4, 2 -NSP5, 3 - NSP6, 4 - NSP35, 5 - NSP36

	1	2	3	4	5
1	100.00	6.25	18.75	12.50	0.00
2	6.25	100.00	87.50	93.75	93.75
3	18.75	87.50	100.00	81.25	81.25
4	12.50	93.75	81.25	100.00	87.50
5	0.00	93.75	81.25	87.50	100.00

The dendrogram obtained using primer OP A9, maximum similarity was observed between NSP 5 along with NSP 35 and NSP 36 (93.75 %), whereas least similarity (0%) was observed between NSP 4 and NSP 36.

## 6. Discussion

### 6.1 Phytochemical Analysis

The phytochemical analysis of these five different plant leaf species of same family namely *Artocarpus heterophyllus* was performed using standard protocol for qualitative determinations. The study indicated that terpenoid was present only in petroleum ether extracts of all plant species except NSP4 and protein was found only in hexane extract of all plants as well as in acetone extract of NSP36. Saponins and flavonoids are present only in aqueous extract of all plants. In all other aqueous extract of these plants tannins, alkaloids, phenol and cardiac glycosides were present except in NSP6. It should be noted that tannins and alkaloids were important compounds which gives antibacterial activity. All the plant extracts except petroleum ether and hexane doesn't contain tannin. Out of all the five plant leaf extract studied, only these compounds tannins, alkaloids, carbohydrate and cardiac glycosides were commonly extracted by using all water, petroleum ether, and hexane and acetone solvents. Rest of the compounds were extracted by different –different solvents. Till now very few phytochemical analyses has been done on *Artocarpus heterophyllus* leaf extract. Few of them have done phytochemical analysis on *Artocarpus heterophyllus* leaf of methanol and aqueous extract.

Ajayi I. A., Ajibade O. and Oderinde R. A., 2011 studied the phytochemical constituents from the seeds of *Artocarpus communis*, *Artocarpus heterophyllus*, *Calophyllum inophyllum*, *Garcinia kola*, *Garcinia man gostana*, *Pentaclethra macrophylla* and *Treulia Africana* and reported that all the plant specimens were found to contain flavonoids and reducing compounds but none of them contained carotenoid and steroids. Tannins were present in

all the samples except *Artocarpus communis*, saponins was not found only in *Artocarpus heterophyllus* and terpenoids was not found only in *Artocarpus communis* which is similar to our findings.

### 6.2 Antioxidant Assays

Deepika Gupta, K et al., 2011, investigated the phytochemical and nutritional property of seeds of jack fruit and proved that they were a good source of nutritional and antioxidant components and hold their potential for value addition and nutraceutical development.

Haidy S et al., 2011 examined the antioxidative, hypoglycemic, and hypolipidemic activities of *Artocarpus heterophyllus* leaf extracts. The ethanol and butanol extract showed scavenging activity for diphenylpicrylhydrazyl radical and chelate Fe<sup>2+</sup> in vitro.

Meshram R. L et al., 2011 19. evaluated in vitro antioxidant activity of *Balanites aegyptiaca* And *Artocarpus heterophyllus* using DPPH method. Acetone extract from the seed of *Artocarpus* showed an antioxidant activity of 12.34 %.

### 6.3 RAPD

RAPD were screened with the five different plant leaf species of same family *Artocarpus heterophyllus*. The pattern of RAPD fragments produced by the 10 - mer primers OP A8 and OP A9 are shown. The two informative primers were selected and used to evaluate the degree of polymorphism and genetic relationships within all the different species of *Artocarpus heterophyllus* under study. The selected primers generate distinctive products. A total of 57 fragments were produced from the two RAPD primers used. The maximum number of fragment bands were produced by the OP A8 primer (GTGACGTAGG) was (32) bands which showed 21.87% polymorphism and 6.25% monomorphism and by the OP A9 primer (GGGTAACGCC) was (25) bands which showed 24%

polymorphism and 3.84% monomorphism.

The dendrogram based on similarity matrix were constructed by using the Unweighted Pair Group of Arithmetic Means (UPGMA). The Dendrogram constructed by similarity matrix by using OP A8 primer shows two major clusters. The first cluster comprises of NSP36, NSP6, NSP4 and NSP5. The second cluster consists of one species of the NSP35. The sample 5 (NSP36) is closely related to sample3 (NSP6) and sample 1 (NSP4) is related to sample 2 (NSP5). The sample 4(NSP35) is highly distinct. On the other hand the dendrogram obtained from OP A9 primer shows two major cluster. The sample 2, sample 4& sample 5 shows least variation within the different species of *Artocarpus heterophyllus* and sample 1 is distinct.).

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