

## INVESTIGATION OF A PETRIFIED FRUIT WITH ARILATED SEEDS FROM THE DECCAN INTERTRAPPEAN SERIES OF MOHGAONKALAN M.P., INDIA.

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### ABSTRACT:-

The fruit is ellipsoidal in shape measures 1.44 to 1.55 mm in length and 0.85 to 0.95 mm in size. The fruit shows single locule containing two large seeds. The pericarp measures 95 to 110 µm in thickness and multilayered. Each seed measure 1.20 X 0.36 mm in size. The seed coat is bitegmic, fibrous and arilated measuring 60 to 65 µm in thickness. The embryo is dicot type and ill preserved, placentation is basal type. Vasculature not clearly seen. The present specimen does not resemble with any of the reported dicot berry type of fruits and with modern dicotyledonous taxa. Hence it is kept under separate form genus *Arilospermocarpon indicum* *gen. et sp. nov.*

**Key Words :-** Deccan, Intertrappean, petrified, unilocular, arilated, dicot, fruit.

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### INTRODUCTION-

The present chapter deals with the study of new petrified dicot, unilocular two seeded arilated, berry type of fruit from well known fossiliferous locality Mohgaonkalan of Chhindwara Dist., M.P., India, which is of uppermost Cretaceous to lower Eocene age. From the Deccan Intertrappean beds many dicot fruits have been reported. Among the reported dicot fruits there are some records of berry type fruits, they are- *Kremocarpon indicum* (Upadhye,1979); *Ramanujamocarpon indicum* (Kolhe,1980); *Tiliaceocarpon intertrappea* (Dixit,1984); *Mahabalecarpon deccanii* (Chauhan,1987). One more fossil dicotyledonous berry is described in this chapter from Deccan Intertrappean beds of Mohgaonkalan, M.P., India.

### MATERIAL AND METHOD:-

The fossiliferous cherts had been collected from the Deccan Intertrappean beds of Mohgaonkalan, M.P., India. While breaking the cherts the fruit was exposed in longitudinal plane. After etching the specimens with hydrofluoric acid (HF), serial peel sections were taken through its part and counter part with Cellulose Acetate peel Technique. The peels were mounted in DPX mountant and photographed. The camera lucida sketches of the slides were drawn for detailed study of fruit cut in transverse plane.

### DESCRIPTION:-

The longitudinally exposed fruit is ellipsoidal in shape measuring 1.44 to 1.55 in length and 0.85 to 0.95 mm in size. The fruit shows single locule containing two large seeds. The pericarp measures 95 to 110 µm in thickness and multilayered. Each seed measure 1.20 X 0.36 mm in size. The seed coat is bitegmic, fibrous and arilated. The embryo is dicot type and ill



preserved, placentation is basal type. Vasculature is not clearly seen. Dehiscence zone is present in pericarp. The fruit shows following detailed anatomical characters -

**Pericarp (Fruit Wall):-** The pericarp is without any outgrowth and measures 95 to 110 µm in thickness, multilayered and differentiated into three zones. Outer zone measures 35 to 40 µm in thickness, made up of 3-4 layered thin walled parenchymatous cell. Each cell measures 10 to 12 µm in size. Middle zone is thinner than outer zone and measures 22 to 25 µm and made up of 3-4 layers of thick walled parenchymatous cell, each cell measures 6 to 8 µm in size. The inner zone is thicker than middle zone and measures 30 to 35 µm in thickness and made up of 2-3 layered elongated parenchymatous cells, each cell of which measures 3-4 X 12-15 µm in size.

**Locules:-** The locule is single and measures 1.520 X 0.800 mm in size containing two arilated, fibrous seeds. The single locule determines the unilocular nature of the fruit. The lumen of fruit shows few patches of soft parenchymatous tissue may be pulpy mass.

**Seed:-** The single locule of fruit contains two large arilated fibrous seeds. Each seed measures 1.20 X 0.36 mm in size. Seed coat is fibrous and bitegmic, 6-7 layered, measuring 60 to 65 µm in thickness. Outer testa consists of 5-6 thick walled vertically elongated parenchymatous cells which measure 45-55 µm in thickness while inner tegmen is prominent, single layered, made up of thin walled horizontally elongated parenchymatous cells and measures 10-15 µm in thickness. At places inner tegmen is fused with seed showing undifferentiated nature (Corner, 1976; Fahn, 1989). The mature seed shows ill preserved dicot embryo. The endosperm tissue is ill preserved showing angular to oval parenchymatous patches at places. At both ends of seed some double layered thick walled parenchymatous cells are fused giving an arilated nature to the seed. Each cell of aril measures 20 to 25 µm in diameter and double layered. The function of aril may not be concluded correctly but it may be for the dispersal of seeds. The seeds are fibrous, and their seed coat is hard and may help seeds to be dormant for a longer time. Hence it could be concluded that the seeds in this fruit are dormant.

**Placentation:-** Each seed shows its attachment towards basal portion of the fruit by means of their placental stalk indicating its basal placentation.

**Vasculature:-** The vasculature in this fruit is not clear but at some places in middle zone of pericarp some xylem strand are observed.

## DISCUSSION:-

- From the above description following important features confirmed its identification-
- Fruit developed from bicarpellary, syncarpus, superior ovary.
  - Fruit wall is soft, multilayered differentiated into outer thick, middle thin and inner thick layers.
  - The locule is single containing two large elongated, arilated, fibrous seeds.
  - Soft parenchymatous tissue found in the lumen of fruit.
  - Seed is dicotyledonous type, with distinct embryo.
  - Seeds show basal placentation.

From the above features the present fruit is confirmed as unilocular, two seeded, dicot berry type with basal placentation. The seeds are arilated and fibrous.

#### IDENTIFICATION:-

The present fruit is compared with and fruits of modern taxa and reported fossil berries

##### Comparison with berries of modern taxa-

The present specimen is compared with the unilocular berries of genera of modern dicot families like- Clusiaceae, Rutaceae, Vitaceae, Punicaceae, Sapotaceae & Convolvulaceae. Clusiaceae (*Garcinia*) is comparable in having globular, smooth walled berry but differ in having 4 seeds while in present specimen seeds are only two. Rutaceae (*Murraya*) is comparable in having two seeded ellipsoid berry but differ in having glands and absence of arils while in present fruit the glands are not seen and seeds are arilated. Vitaceae (*Ampeloaissus*, *Cayratia*, *Cissus*), differs in having many seeded berries. Punicaceae (*Punica*) is comparable in having berries with arilated seeds but the number of seeds are more and aril filled with acidic or sweet juice means made up of soft tissue and seed coat is simple while in present specimen seeds are two, aril is made up of hard tissue and seed coat is fibrous. Sapotaceae (*Manilkara*) is similar in having 1-2 seeded berry but differs in absence of arils and fibrous nature of seed which characters are seen in the present fruit. Convolvulaceae (*Argyreia*) differs in having 4 seeded berries.

##### Comparison with reported berry fruits-

It is compared with fossil berry such as- *Kremocarpon indicum* (Upadhye,1979). It is comparable in unilocular nature but is without any seed formation and pericarp with pappilate projections while in present specimen two seeds are present and pericarp is smooth. *Ramanujamocarpon indicum* (Kolhe,1980) also differs in possession of numerous seeds while in present specimen the seeds are only two. *Tiliaceocarpon intertrappea* (Dixit,1984) is also many seeded berry hence could not be compared with the present specimen. *Mahabaleocarpon deccanii* (Chauhan, 1987) is unilocular berry with only one seed while present fruit contains two seeds. Hence the present fruit does not show exact similarity with any of the reported fossil fruit.

A comparison with known fossil dicot berries and with the genera of modern dicotyledonous taxa indicates that the present specimen does not resemble with any of the reported dicot berry type of fruits and with modern dicotyledonous taxa. Hence it is kept under separate form genus *Arilospermocarpon indicum gen. et sp. nov.* Generic name is after the arilated seeds of the fruit and specific name is after India.

#### DIAGNOSIS:-

*Arilospermocarpon gen. nov.*

The fruit is unilocular, two seeded berry, dicot fruit showing basal placentation. The seeds are arilated and fibrous.



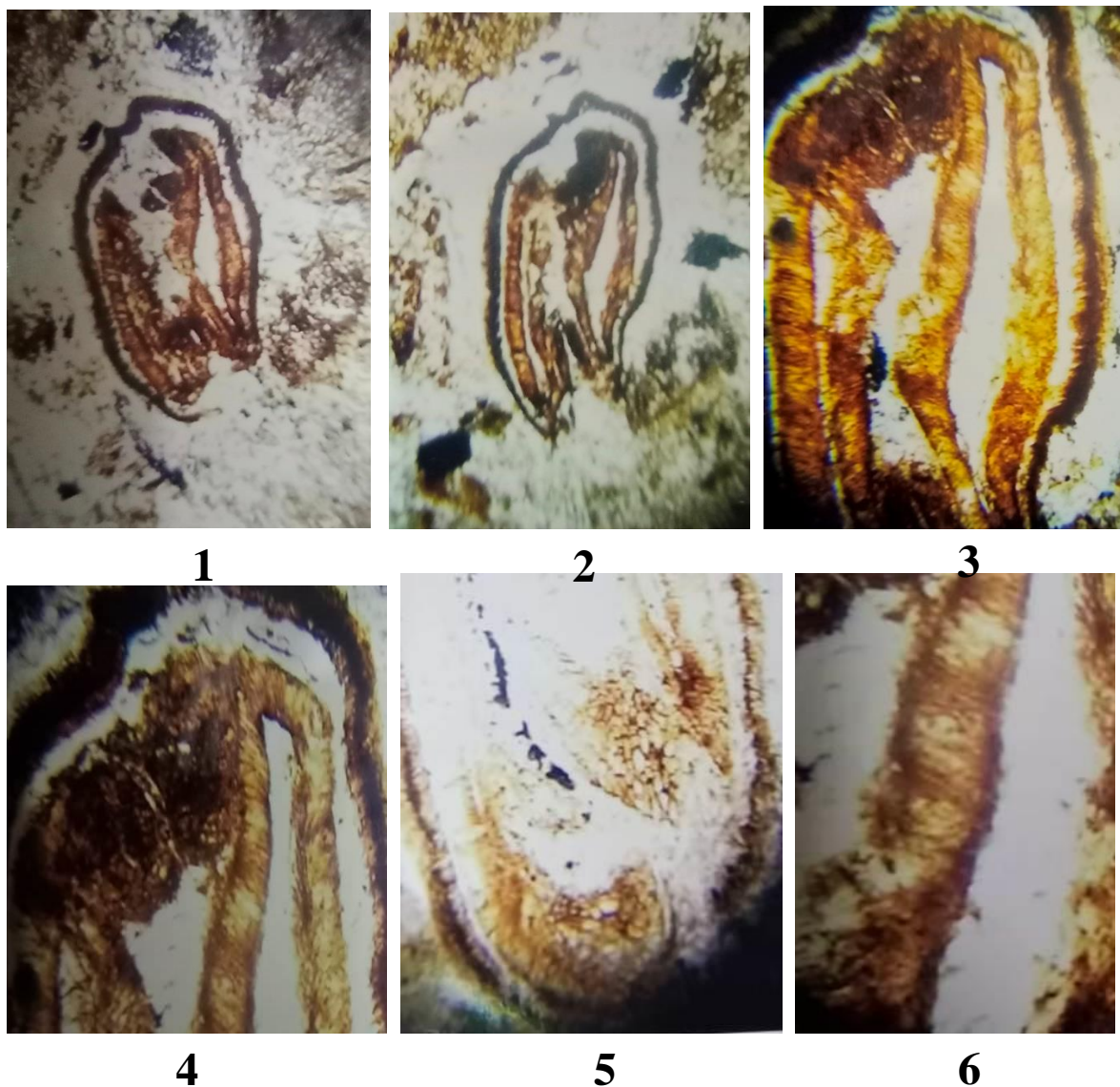
***Arilospermocarpon indicum gen. et sp. nov.***

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## PLATE FIGURES



### **Explanation of Plate Figures :-**

**Fig. 1& 2 - Fruit in L. S. part and counter part**

**Fig. 3- Fruit in L. S. magnified**

**Fig. 4- Seed with attached arils at upper portion of pericarp magnified**

**Fig. 5- Seed with attached arils at lower portion magnified**

**Fig. 6 - Seed coat showing Testa and Tegmen**