NEW SPECIES OF WINGED FRUIT (*Gyrocarpusocarpon mohagaonii Sp. Nov.*) FROM THE DECCAN INTERTRAPPEAN BED OF MOHAGAON KALAN IN DIST. CHHINDWARA, MADHYA PRADESH, INDIA

Manoj Niranjane[1*] and Rajesh Dahegaonkar[2],

[1] Research Scholar, CHLR, Department of Botany, Dr. Ambedkar College of Arts, Commerce and Science, Chandrapur (India).

[2] Supervisor and Head, Department of Botany, Dr. Ambedkar College of Arts, Commerce and Science, Chandrapur (India).

Abstract: The present paper deals with the description of a Fruit from the Deccan Intertrappean Beds of Mohagaon Kalan, District Chhindwara, Madhya Pradesh, India. The locality (N22.015029^0, E79.186714^0) shows well-preserved fossil flora belonging to the Intertrappean Beds of India (65 – 70 million age). It is observed in the chert collected from the area behind the school in Mohagaon Kalan. After etching the chert with Hydrofluoric acid, followed by peeling it with Celloidin solution, it is evident that the given specimen shows longitudinally exposed fruit. it is oval or semicircular in shape. The unilocular, single-seeded, indehiscent samaroid fruit has a single big wing for dispersal. It is broad on one side and tapered on the other. It is a non-endospermic dicot fruit with a multilayered thick wall.

***Keywords*: Deccan Intertrappean, Angiosperm, Dicot Fruit, Samaroid.**

INTRODUCTION

From the Deccan Intertrappean beds, many dicot fruits are reported, such as. *Gyrocarpusocarpon intertrappea* (Mistri, 1988), *Nautiyalocarpon singhpurii* (Juneja, 1993), *Pantocarpon deccanii* (Junega, 1993) *Bicarpelocarpon singhpuri* (Bhowal,1998) *Enigmocarpon parijai* (Sahni, 1943) *Indocarpa intertrappea* (Jain, 1963) *Wingospermocarpon Mohgaonese* (Sheikh & Kapgate, 1984), *Gyrocarpusocarpon singhpurii* (Dahegaonkar 2002)

The present fruit is the additional report of winged fruit from the Deccan Intertrappean beds of Mohagan kalan, Dist – Chhindwara, Madhya Pradesh, India.

MATERIAL AND METHOD:

The present specimen is preserved in a big silicified chert. It is exposed in L.S plane after breaking the chert into the pieces. It is studied by peel section after etching it with hydrofluoric acid. Preservation of the material is very good. Only part was available, and the

counterpart was lost during the breaking. The anatomical details are studied by taking serial sections along the same plane. Biowizard software was used for photography and measurement of the material.

GENERAL DESCRIPTION:

The fruit is oval or semicircular in shape. It is unilocular, single-seeded, indehiscent samaroid-type fruit with a single large wing for dispersal mechanism, the fruit measures about 12447 µm long and 1347.4µm broad, including wings. It is broad at one side and slightly tapers at the other side. The seed is large, 648.7 × 647.4µm in dia. It is dicotyledonous, non-endospermic. The fruit wall is thick and multilayered (plate II Photo- 17).

PERICARP/ FRUIT WALL:- The fruit wall is well preserved. It is quite thick and measures about 150 µm. The wall of the fruit is multilayered and differentiated into three zones, outer epicarp, middle mesocarp and inner endocarp. (plate II Photo 17.) But Epicarp and mesocarp is seen but endocarp is absent. The pericarp is expanded in the form of wing for the dispersal mechanism.

EPICARP:- The outer epicarp is measured about 31.6µm thick and is made up of single-layered, moderately thick-walled parenchymatous cells. (Plate II Photo 17)

MESOCARP: The mesocarp measures about 112.2µm in thickness and is made up of thin-walled parenchymatous, loosely arranged cells (Plate II Photo 17).

WING:- 894.2µm in length and 1542.1µm in breadth. The wing is single, occupying the apical region of the fruit and probably meant for wind dispersal. The pericarp is expanded as an outgrowth in the form of a wing. The lumen of the wing is filled with loose parenchymatous cells. The cellular detail of the wing is very similar to that of the fruit wall. Wings consist of multilayered tissue, which is differentiated into outer multilayered loosely arranged thin-walled cells (Plate II Photo 20).

LOCULE:- The fruit is unilocular, the size of the locule 554.2 µm in length and 546.7µm in breadth (Plate II Photo 16).

SEED:- The seed is single, large, occupying the maximum portion of the locule. It measures about 648.7 ×647.4 µm in diameter. The seed coat and inner limiting layer of the fruit wall are indistinct and cannot be differentiated (Plate Photo 19).

EMBRYO:- Not preserved.

DISCUSION AND IDENTIFICATION

From the above description of the fruit, it reveals that the following important characteristics are considered for the identification of the fruit

1) Unilocular, indehiscent, Samaroid fruit
2) A single large wing for the dispersal mechanism
3) A single large seed.
4) The fruit wall shows epicarp, mesocarp
5) The wing is an expanded portion of the fruit wall.

It is evident from the above characters that the specimen is of a simple dry indehiscent, unilocular, single-seeded fruit, and the wing is an expanded portion of the fruit wall; such a fruit is called a samaroid.

COMPARISON WITH FOSSIL FRUIT:

The present fossil fruit is compared with the recorded fossil dicotyledonous fruits. It is compared with the *Singhpurocarpon biradari* (Mistri, 1989) is a unilocular three-seeded baccate fruit with parietal placentation, which differs from the present specimen. The fossil fruit *Phyllanthocarpon singhpuri* (Mistri, 1989) is a trilocular, Capsular fruit with two seeds in each locule, hence, it is not comparable. The fruit *Nautiyalocarpon singhpurii* (Juneja, 1993) is a bilocular, drupaceous, single-seeded fruit which differs from the present specimen. *Pantocarpon deccanii* (Juneja, 1993) is a trilocular single-seeded monocot fruit which is totally different from the present specimen. It is also compared with *Schizocarpon aliformii* (Bhowal, 1998) is a bilocular single-seeded fruit with unitegmic seedcoat, which is totally different from the present specimen. The present fossil fruit is compared with the *Bicarpellocarpon singhpurii* (Bhowal, 1998), which is a bilocular, sessile capsular fruit with empty air sacs and a bitegmic seed, which is not compared.

The fruits such as *Enigmocarpon parijai* (Sahni, 1943) *Indocarpa intertrappean* (Jain, 1966), *Harrisocarpon sahnii* (Chitaley and Nambudiri, 1973) *Daberocarpon gerheredi* (Chitaley and Sheikh 1975) *Sahniocarpon harisii* (Chitaleypatil, 1972) and *Deccanocarpon arnoldi*(Paradkar, 1975) all are the capsular fruits and hence it is differ from the present specimen.

It is compared with the *Wingospermocarpon mohgaonse* (Sheikh and Kapgate, 1984), in which the seeds are winged and not fruit, hence it differs from the present specimen. *Gyrocarpusocarpon singhpurii* (Dahegaonkar, 2002) in which the fruit is unilocular, single-seeded, and well preserved embryo is present it is differs from the present specimen.

COMPARISON WITH THE MODERN FAMILIES:-

The present samaroid fruit is compared with the modern families having winged fruit (Rendle, 1967; Mc-lean & Cook, 1956; Esau, 1961; Earns 1953; Cook 1967). It is obvious that the characters of the fossil fruit are seen spread over the families Malphighiaceae, Simarubaceae, Urticaceae, Rhamnaceae, Dipterocarpaceae, Dioscariaceac, Moringaceae, Melliaceae, Bignoniaceae and Combretaceae.

The family Dipterocarpaceae possess uni or multilocular fruit and persistent calyx, which form the wing of the fruit; these characters are not found in the present fruit.

In the families Moringaceae, Bignoniaceae and Meliaceae, the wings are developed from the testa, therefore, the present specimen is not compared.

In the family Malphighiaceae of genus *Aspidopterys* and *Hiptage*, the fruits are samaroid, having one or more membranous wings. The seeds are with straight embryo and it is trilocular in nature of the fruit, while the present specimen is unilocular and single-seeded seeded hence it differs. In the family Dioscariaceae of the *Dioscoria* alata and species *Praxinusacer* having wings of the fruits developed from the pericarp.

In genus *Alianthus* and *Samandra* of the family Simarubaceae show a similar type of fruit, having a membranous large wing, multizoned fruit walled and a membranous seed coat, but they greatly differ from the present specimen in having multichambered fruit and each containing one to five seeds in each locule.

In the family Urticaceae of genus *Holotelea*, the fruit is unilocular, simple, a drupe, or a samara having an erect, membranous seedcoat. It differs in having more than one wing.

The fruit of the family Rhamnaceae genus *Ventilago* also resembles having a single-seeded, unilocular fruit, but it is a capsule or a winged or drupe, and the fruit is surrounded by an adherent calyx tube thick seed coat, which is lacking in the present fruit.

The fossil specimen shows more similarity with the tropical family Combretaceae, especially with the genus *Anogeissus* and *Gyrocarpus* in having angular, drupaceous, large wings, unilocular and one-seeded fruit seed is large, the seed coat is thin, membranous, with a straight embryo having two large cotyledons. But the fruit of *Anogeissus* differs in having two wings. The genus *Gyrocapus* shows closest similarities with the minor differences, such as the size and shape of the fruit and seed. Stony fruit wall and thick seed coat.

After comparisons with the reported fossil fruit and the fruits of the modern families, it shows a close resemblance to the fossil genus. *Gyrocarpusocarpon singhpurii* (Dahegaonkar, 2002) with minor differences and hence a new species of the genus *Gyrocarpusocarpon* as

Gyrocarpusocarpon mohagaonii is created to accommodate this fruit. The specific name is after the name of the locality from which the fruit is collected.

DIAGNOSIS

***Gyrocarpusocarpon mohagaonii* sp. nov**.

Unilocular, dry, indehiscent, oval or semicircular, with one large wing for dispersal. Fruit size is 1244.7 µm long and 1347.4 µm broad, the fruit wall is 150 µm thick and differentiated into three zones, outer epicarp, middle mesocarp and inner endocarp. A single seed with, large embryo is not preserved.

Holotype: MAN/ Ang fruit/ Deposited at Department of Botany, Dr Ambedkar College of Arts, Commerce and Science, Chandrapur.

Horizon: Deccan Intertrappean beds

Locality: Mohagaon Kalan, Madhya Pradesh, India

Age: ? Uppermost Cretaceous

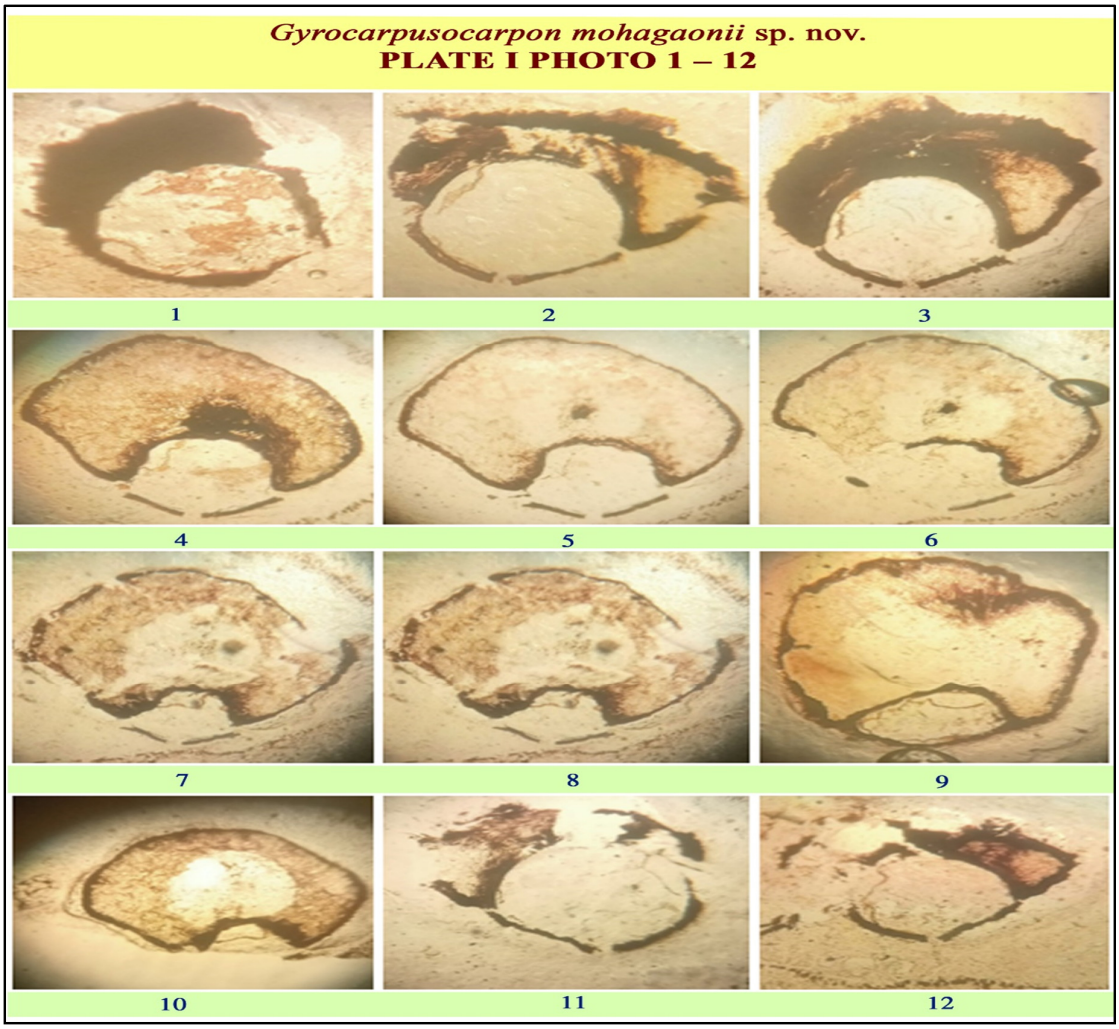

Figure: 1 to 3 L-S of fruit showing single wing with a single locule; 4 to 7- L.S. of Fruit showing the Increasing size of Locule and seed size; 8 to 10- L.S. of Fruit Size of locule decreasing containing a single seed; 11 to 12- L.S. of fruit showing disappearing wing.

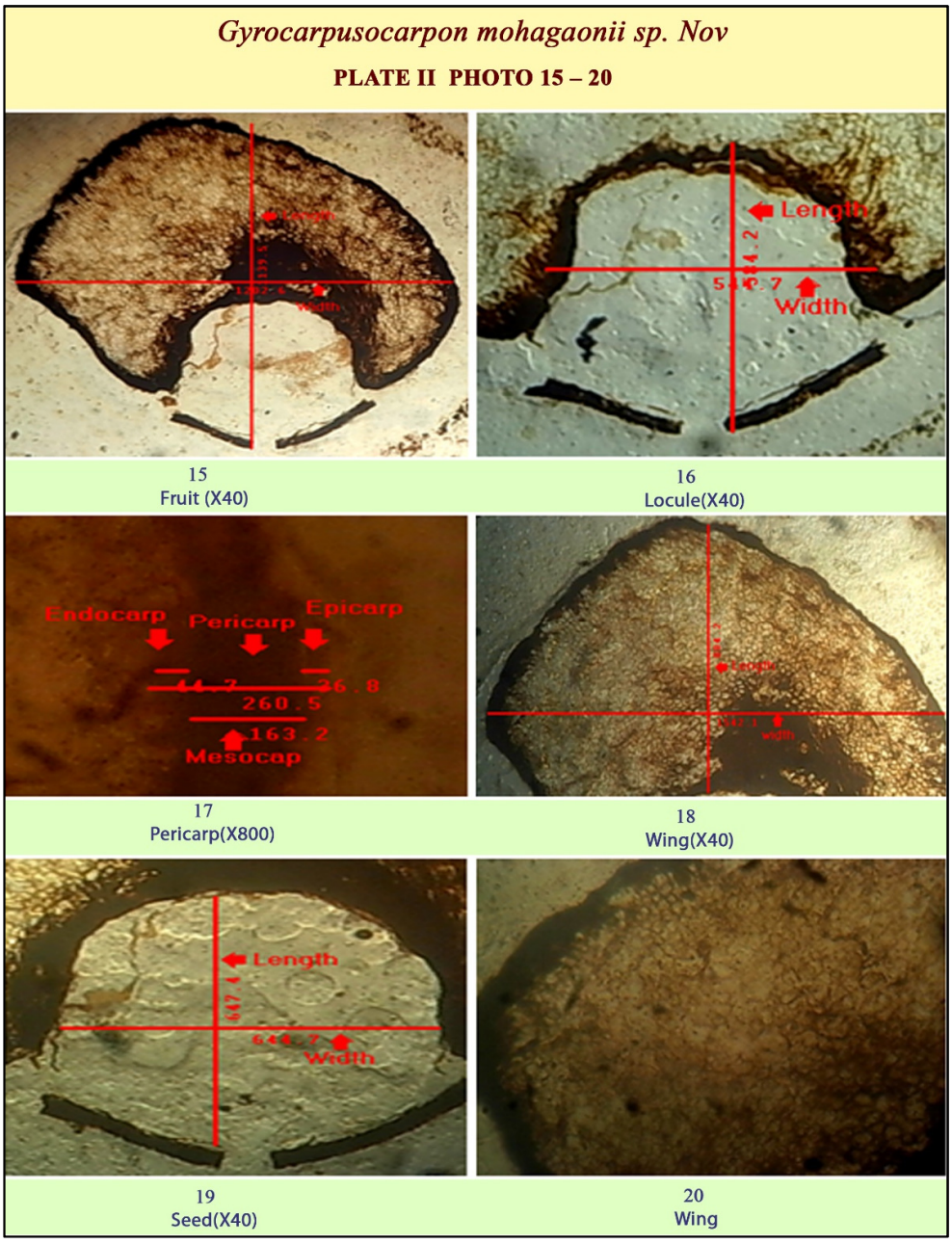

Figure: 15- L-S of fruit showing oval or semicircular wing; 16- L-S of fruit showing Locule and seed size; 17- L-S of fruit wall differentiated in to epicarp, mesocarp and endocarp; 18- L-

S of fruit showing Wing size; 19 - L-S of fruit showing Locule contains single seed; 20- Enlarged view of the wing

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