

Chromosome Number of Four *Garcinia* Species of Assam

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Abstract – The *Garcinia* species belongs to the family *Guttiferae* (*Clusiaceae*) is an important fruit species found in a semi wild condition in Assam. Fruits are important as they are the rich source of hydroxy citric acid and also have many medicinal values. Being a polygamodioecious plant it shows lots of variations among different species. Hence a cytological study was undertaken to study the chromosome number of four *Garcinia* species of Assam viz. *Garcinia pedunculata*, *Garcinia cowa*, *Garcinia lanceaefolia* and *Garcinia xanthochymus*. Karyotype study revealed that chromosome number of *G. pedunculata*, *G. cowa* and *G. lanceaefolia* was found to be $2n=48$ whereas *G. xanthochymus* had $2n=72$ numbers of chromosome.

Keywords – Assam, Chromosome, *Garcinia*, *Guttiferae*, Karyotype.

I. INTRODUCTION

The *Garcinia* species belongs to the family *Guttiferae* (*Clusiaceae*). The genus arose in South east Asia, ranging from the southern part of Thailand and peninsular Malaysia to Indonesia and to some parts of the Phillipines [1]. The genus has about 200 species of mostly small to medium sized trees distributed in Southern part of Thailand and Peninsular Malaysia to Indonesia, and distributed in South East Asian region [2, 3]. High density of species is found in Southeast Asia, Indian subcontinent as well as in areas neighboring Southeast and South Asia such as Indo-China. The genus also occurs in Africa. Among the 800 species of *Garcinia* in the world it is thought that only 40 species produce edible fruits [4]. In India the genus is represented by 35 species [5] and the *Garcinia* grow extensively in a semi wild condition in the states like Maharastra, Goa, coastal areas of Karnataka, Kerela, evergreen forest of Assam, Khasi, Jantia hills, West Bengal and Gujarat. Among these 15 species are included in NE India and 8 species are reported from Assam [6,7]. In North East region, the sundried slices of fruits are used for culinary purposes and folk medicine. *Garcinia* plants are insect pollinated and polygamodioecious, a lot of morphological variations occur in plant height, leaf morphology and fruit characters. Hence a systematic study was undertaken to see whether the polymorphism also existed at genetic level, and a karyomorphological study was initiated under department of Horticulture, Assam Agricultural University, Jorhat.

II. MATERIALS AND METHODS

To determine the chromosome number of the four selected *Garcinia* species, flower buds were collected and fixed in 3 : 1 carnoy solution (a mixture of absolute ethyl

alcohol and glacial acetic acid). After 24 hours the buds were transferred into 70 per cent alcohol solution and preserved under refrigerated condition.

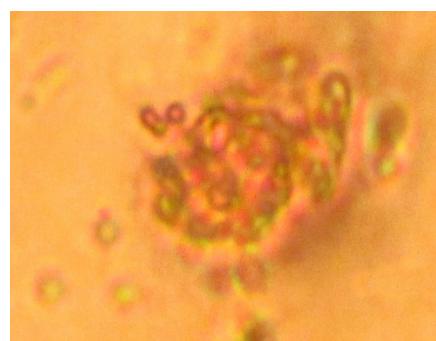
At the time of slide preparation flower buds were squashed in 1.2 per cent acetic carmine and semiparment slides were counted [8]. Atleast 50 slides were prepared under microscope no and photographed using digital camera.

III. RESULTS AND DISCUSSION

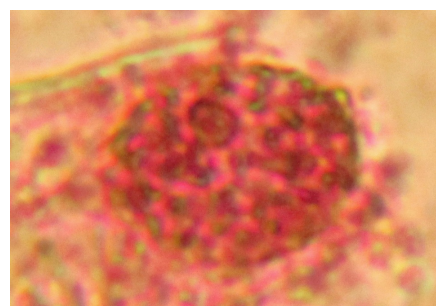
The karyotype of *Garcinia* species was determined by chromosome study. For chromosome study flower buds of male flower were collected and chromosome number of metaphase stage was counted and data are presented in table 1.

Table I: Chromosome number of *Garcinia* species:

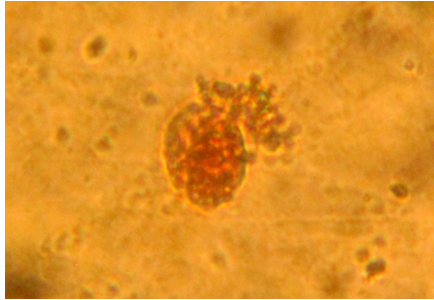
Species	Number of Cells Counted	Chromosome Number	
		n	2n
<i>Garcinia pedunculata</i>	50	24	48
<i>Garcinia cowa</i>	50	24	48
<i>Garcinia lanceaefolia</i>	50	24	48
<i>Garcinia xanthochymus</i>	50	24	72



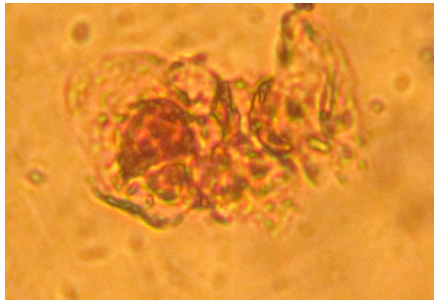
Meiotic metaphase (*G. pedunculata*)



Meiotic metaphase (*G. cowa*)



Meiotic metaphase (*G. lanceaeifolia*)



Meiotic metaphase (*G. xanthochymus*)

The chromosome number of *Garcinia pedunculata*, *Garcinia cowa* and *Garcinia lanceaeifolia* was found to be $2n = 48$ except in *Garcinia xanthochymus* with $2n = 72$. From the study it was revealed that *Garcinia pedunculata*, *Garcinia cowa* and *Garcinia lanceaeifolia* become diploid in nature whereas *Garcinia xanthochymus* is triploid. Lack of information on chromosome number and chromosome morphology in this family make it difficult to construct evolutionary trends. There is very wide variations in chromosome number among the genera such as *Clusia*, *Hypericum* and *Garcinia*, in these species different chromosome numbers have been detected. In *Clusia*, $n=30$ [9]. And that of *Hypericum* and allied genera to be $x=8$ or 9 . Much earlier it has been reported that somatic chromosome number of *Garcinia indica* to be $2n=48$ [10]. Same result has been reported in *Garcinia morella*, *Garcinia cowa*, *Garcinia cambogia*, *Garcinia spicata* and *Garcinia pariflora* [11]. Similarly $2n=72$ number of chromosome was reported in *Garcinia xanthochymus* [12].

IV. CONCLUSION

The present study indicated that there is variation in chromosome number between the four species of *Garcinia*. *Garcinia pedunculata*, *Garcinia cowa* and *Garcinia lanceaeifolia* was found to be $2n = 48$ except in *Garcinia xanthochymus* with $2n = 72$. So there is a scope for genetic assessment and breeding due to presence of variability in chromosome.

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