

Mitotic and Meiotic Chromosome Study in *Vallenus malabaricus* (Boddaert). Charadriiformes: Aves.

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ABSTRACT : The mitotic and meiotic chromosome study in *Vallenus malabaricus* were performed from bone marrow tissue and testes respectively. The mitotic metaphase plates showed diploid modal value $2n = 76 \pm$. The meiotic showed diakinesis and metaphase stage with 38 bivalents confirming the diploid modal value $2n = 76 \pm$. From Karyological analysis, the macrochromosomes were 20 in number and rests of the 56 chromosomes were dot shaped acrocentric chromosomes. The macrochromosomes includes four pairs of metacentric, four pairs of submetacentric one pair subtelocentric and one pair of telocentric chromosomes. The meiotic stages showed diakinesis showing chiasma and crossing over stages. From Karyology study it is evident that order Charadriiformes represents heterogeneity.

Key Words: Karyotype, Charadriiformes, Aves.

I. INTRODUCTION

Taxonomically order Charadriiformes includes 329 of extant species under 104 genera and 15 families. It shows an extremely diverse condition both in morphology and Karyology (Bian et.al 1993). This order is karyologically known through 60 out of 329 taxonomically known species which accounts for only 18% of described species (Sethi, et .al 2002). Keeping in view of the paucity of cytological data the Karyological analysis has been performed to obtain more data on avian Karyology. Distinct Karyological heterogeneity in this order put forth some interesting problems of classification and phylogenetic relationship.

II. MATERIALS & METHODS

Adult male bird was collected from Odisha with due permission from .Chief Wild Life Warden, Odisha. Chromosomes were harvested from bone marrow tissue following air drying procedure of Ford and Hamerton (1956). Morphometric analysis of chromosomes was done following Levan *et. al.* 1964). Meiotic cell preparation was done by the technique suggested by Shoffner *et.al.* (1967).

III. OBSERVATION

For Morphometric analysis of the chromosomes a single male individual was collected from Berhampur, Odisha. The mitotic and meiotic chromosome preparation was performed from the bone marrow and testes tissue respectively. The diploid modal value is $2n=76 \pm$. There is no clear demarcation between the macro and micro chromosomes. However, twenty macro and 56 micro chromosomes either dot shaped or acrocentric were identified. On further analysis four pairs of m-type, 4 pairs of sm- type ,one pair of st- type and one pair of t –type chromosomes has been identified. The sex chromosomes could not be traced because only one male individual is available for the study. From the meiotic chromosomal analysis, the diakinesis stage is well marked with a number of chiasma. Anaphase stage also well marked.

IV. DISCUSSION

Order Charadriiformes, out of 15 families only three families are cytologically known. Family Charadriidae, Scolopacidae and Laridae are cytologically known through 12, 19 and 11 species respectively (Bian et.al 1993). It shows wide range of diploid modal value ranging from minimum $2n= 40 \pm$ in *Burhinus oedicnemus* (Bulatova, 1977) to a maximum $2n=98 \pm$ in *Gallinago gallinago* (Hammer, 1970). It suggest that occurrence of series of centric fission of microchromosomes as well as centric fission of macrochromosomes might have resulted in decrease and increase of diploid modal number respectively (Bian, et.al.1993). The karyomorphology of *Vallenus malabaricus* reveals four pair of metacentric chromosomes, four pairs of submetacentric chromosomes, one pair of subtelocentric chromosome and one pair of telocentric chromosomes. The Karyological comparisons among charadriids show gross uniformity in Karyology with little variations. It is also evident that, although order Charadriiformes represent chromosomal heterogeneity still there exists

appreciable conservatism at genus level. It may be concluded structural rearrangement of various kinds play key role in evolution resulting in chromosomal heterogeneity among Charadriidae.

REFERENCES

- [1.] Bian,X.; Cai,H.; Li,Q. *et. al* (1993). Studies on karyotype of birds: XIV 14 species o charadriiform birds, Dongwuxue Yanjiu, vol.43,pp: 79-80.
- [2.] Bulatova,N.S. (1977). Chromosome structure and evolution in birds. In: 'the cytogenetics of the hybrids, mutation and karyotype evolution'. Nauka , Novosibirsk.
- [3.] Ford, C.E. and Hamerton, J.L.(1956). A colchicines hypotonic squash sequence for mammalian chromosomes.Stain Tech., 31: 247-254.
- [4.] Hammar,B.(1970). The karyotype of 31 birds.Heredatas, 65:29-58.
- [5.] Levan,A.; Fredga, K.and Sandberg,A.A.(1964). Nomenclature for centromeric positions in chromosomes. Hereditas, 52: 01-220.
- [6.] Sethi,R., Mohanty,M.K. and Bhunya, S.P.(2002). Karyotype of two Indian birds (Spurwinged Plover and Brown Shrike). Ind. J.Poult .Sc.37(2):169-171.
- [7.] Shoffner, R.N.;Krishan,A.; Haiden,G.J. and Bammi, R.K. (1967).Avian chromosome methodology.Poult. Sc. 46(2): 334-344.



