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OCCURRENCE OF AUTOSOMAL MONOSOMIC FEMALE BLACK RAT FROM A RADIOACTIVE AREA—A CYTOGENETIC SPORT

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THE loss of one chromosome in the karyotype, i.e. $(2n-1)$ chromosomes or monosomy, is rare in animals, although it is known in natural plant populations¹⁻⁶. Only a few cases of human autosomal monosomy have been reported^{7,8}. We report a chromosome 9 monosomy in a female rat from a natural population.

Seventysix black rats (*Rattus rattus*) were caught at random in Chhatrapur (19.21°N, 85.03°E), Ganjam district, which is situated on the coast of Orissa state and is known for its background radioactivity due to deposition of thorium-enriched monazite sands in the beach area. Chromosomes from bone marrow cells following the colchicine-citrate-Giemsa air drying technique⁹ were prepared. Karyotypes were constructed from photomicrographs of well-spread metaphases¹⁰.

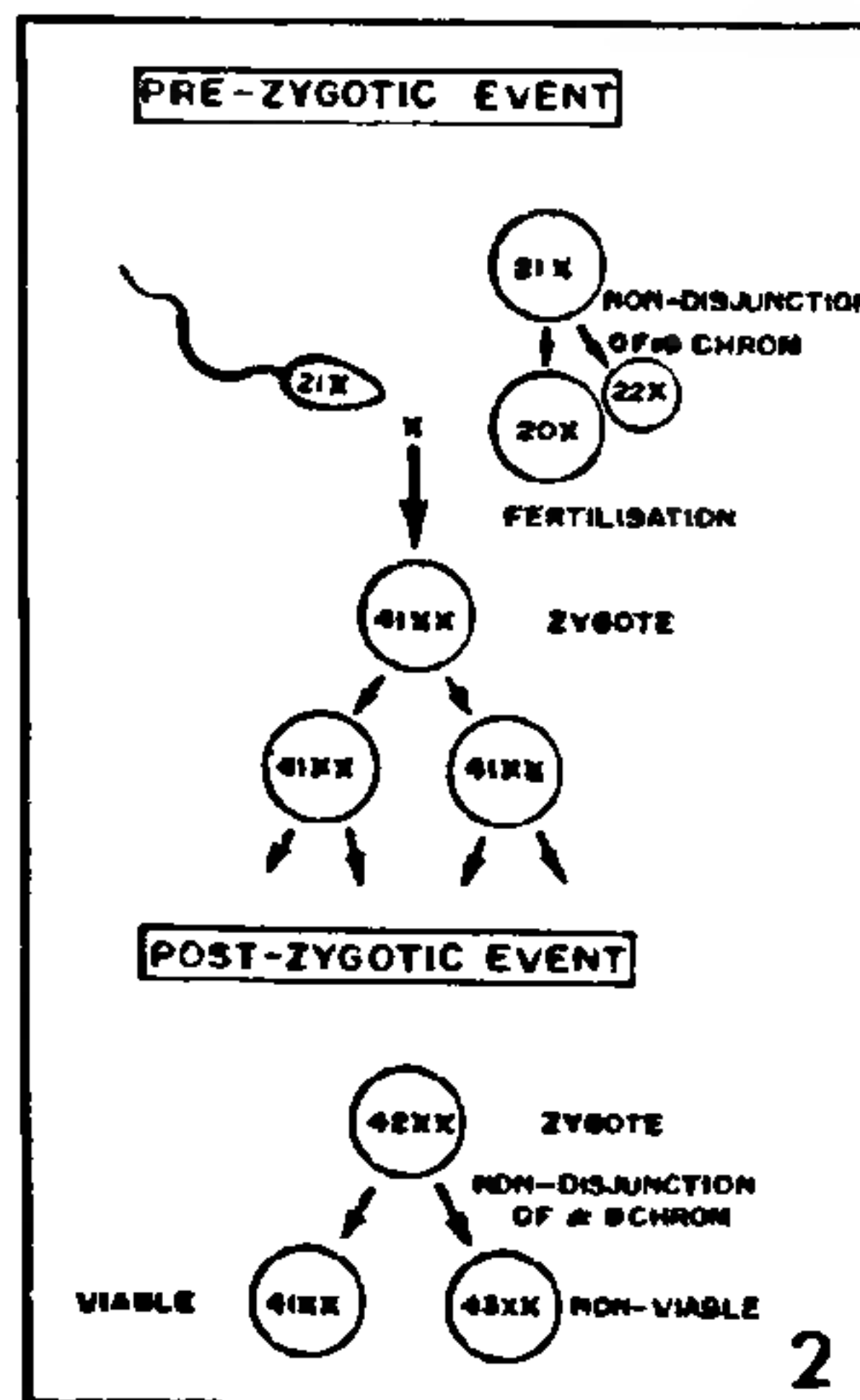
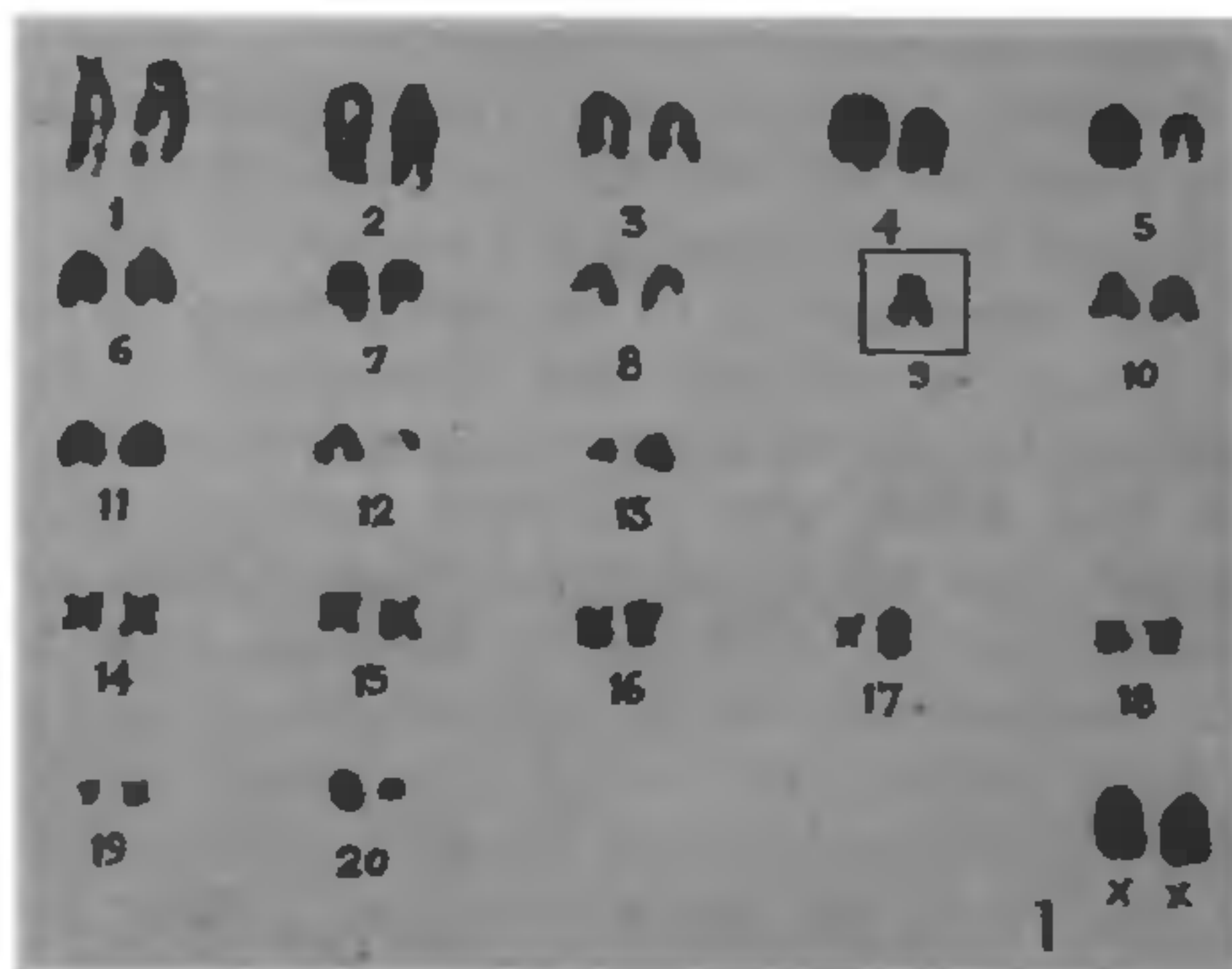
Of the 76 individuals studied cytogenetically, 46 were females and 30 were males. Seventyfive individuals had the usual diploid number of 42 chromosomes. Only one female (CHA ♀ 56) had 41 chromosomes (figure 1) in all the cells examined from the bone marrow. There was no visible abnormality in this individual, except for severe inflammation in the right side of the abdomen below the skin, which was suspected to be a solid tumour.

The normal karyotype of Chhatrapur rat includes 13 pairs of acrocentrics, 7 pairs of metacentrics, and acrocentric XX or XY chromosomes. Karyotype analysis of CHA ♀ 56 showed that one homologue of chromosome 9 was lost.

The human autosomal G monosomy is associated with many abnormal features described as antimon-

golism¹¹. Monosomies 5 and 7 have been reported to be more frequent in acute non-lymphocytic leukaemia (ANLL), and monosomies 8 and 22 have been found to be associated with meningiomas⁸. The role of monosomy in initiating carcinogenesis is not yet clearly understood. But it has been suggested that genomic alterations may predispose some individuals to cancer¹². In mammals, spermatocyte and oocyte aneuploidy may increase with age¹³ and with exposure to temperature variations, radiation and chemicals¹⁴⁻¹⁶.

The chromosome 9 monosomy detected in a



Figures 1 and 2. 1, Karyotype of the female monosomic rat. 2, Possible mechanisms for the origin of monosomic female rat (41, XX).

female rat may have arisen from a non-disjunction event in oogenesis or spermatogenesis in the parents or non-disjunction at a post-zygotic stage (figure 2).

Survival of a monosomic individual poses questions as genetic imbalance is not favoured in the developing organism. However, the fact that autosomal monosomies do exist, and that trisomy, the countertype of a given monosomy, is always detectable, appear to suggest that autosomal monosomy *per se* is not necessarily lethal. If this is true, it can be assumed in the present case that the remaining homologue of chromosome 9 is devoid of any recessive lethal gene.

Why was monosomy of only chromosome 9 detected? It is possible that chromosome loss is not a random process. Earlier workers¹⁷ have shown that chromosomes 1, 9 and 13 in the rat are most vulnerable to structural rearrangements. In the present case it seems chromosome 9 is a sensitive element in the chromosome complement, but its loss exerts no effect on the phenotype or survival of the animal.

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A CASE OF FURUNCULOSIS IN LABORATORY-REARED *LATES CALCARIFER*

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OF the bacterial diseases of fishes, furunculosis has received the most attention. The pathogen responsible for this disease, *Aeromonas salmonicida*, commonly causes systemic disease in salmonids and in several freshwater forms. Sometimes the skin may also be affected in these species of fishes. As the disease is infectious, it is very important to take precautionary measures to prevent the infection from spreading. This paper deals with the skin form of furunculosis in *Lates calcarifer* and its recovery through a successful treatment.

Fifteen *L. calcarifer* measuring about 8–10 cm in length were reared in the laboratory in a 200 l capacity perspex tank. The fishes were maintained under optimum oxygen level and 30 ppt salinity. During the period of observation (25 days), one fish developed marked dullness and skin lesions, and was removed from the group and kept separately in another tank. Water in both the tanks was changed and the fishes observed closely for these symptoms in the rest of the group.

Clinical materials, namely swabs from lesions and exfoliated tissue, were inoculated on nutrient agar,