

Date
15th June, 2020

Page no. :- 01

Dr. Rajesh Vampr, Assistant
professor and Head, U.G.
Department of Zoology, D.K.
College Durgam (Buxi). Notes for
B.Sc. part 3rd, paper VI, Unit - 2(13).

Question :- Write Notes on SEX-LINKED
INHERITANCE ?

Answer :- sex linkage describes the
sex-specific patterns of inheritance
and presentation when a gene
mutation (allele) is present on a
sex chromosome (allosome) rather
than a non-sex chromosome
(autosome). In humans, these are
termed x-linked recessive, x-linked
dominant and Y-linked. The
inheritance and presentation of all
three differ depending on the sex
of both the parent and the
child. This makes the characteris-
-tically different from autosomal
dominance and recessiveness.

Illustration of some x-linked heredity
outcomes (A) the affected father
has one x-linked dominant
allele, the mother is homo-
-zygous for the recessive allele:

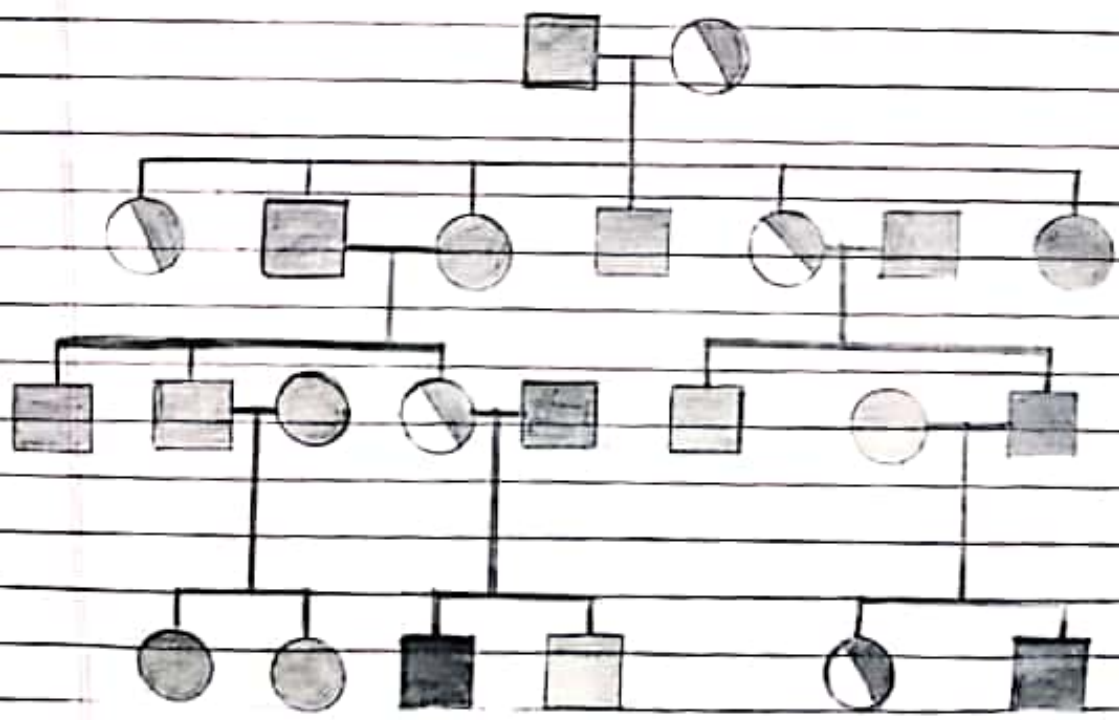
Date
15-06-2020

Page no. :- 02

Page no.

Only daughters (all) will be affected (B) the affected mother is heterozygous with one copy of the X-linked dominant allele: both daughters and sons will have 50% probability to be affected. (C) the heterozygous mother is called "carrier" because she has one copy of the recessive allele: sons will have 50% probability to be affected 50% of unaffected daughters will become carriers like their mother.
- or.

X-Linked dominant inheritance :-



- Affected Female
- ◐ Carrier Female
- Normal female
- Affected male
- Normal male

Each child of a mother affected with an X-linked dominant trait has a 50% chance of inheriting the mutation and thus being affected with the disorder. If only the father is affected, 100% of the daughters will be affected, since they inherit their father's X chromosome and 0% of the sons will be affected, since they inherit their father's Y chromosome.

There are less X-linked dominant conditions than X-linked recessive, because dominance in X-linkage requires the condition to be present in females with only a fraction of the reduction in gene expression of autosomal dominance, since roughly half (or as many as 90% in some cases) of a particular parent's

bte
-6-2025

Page no. :- 04

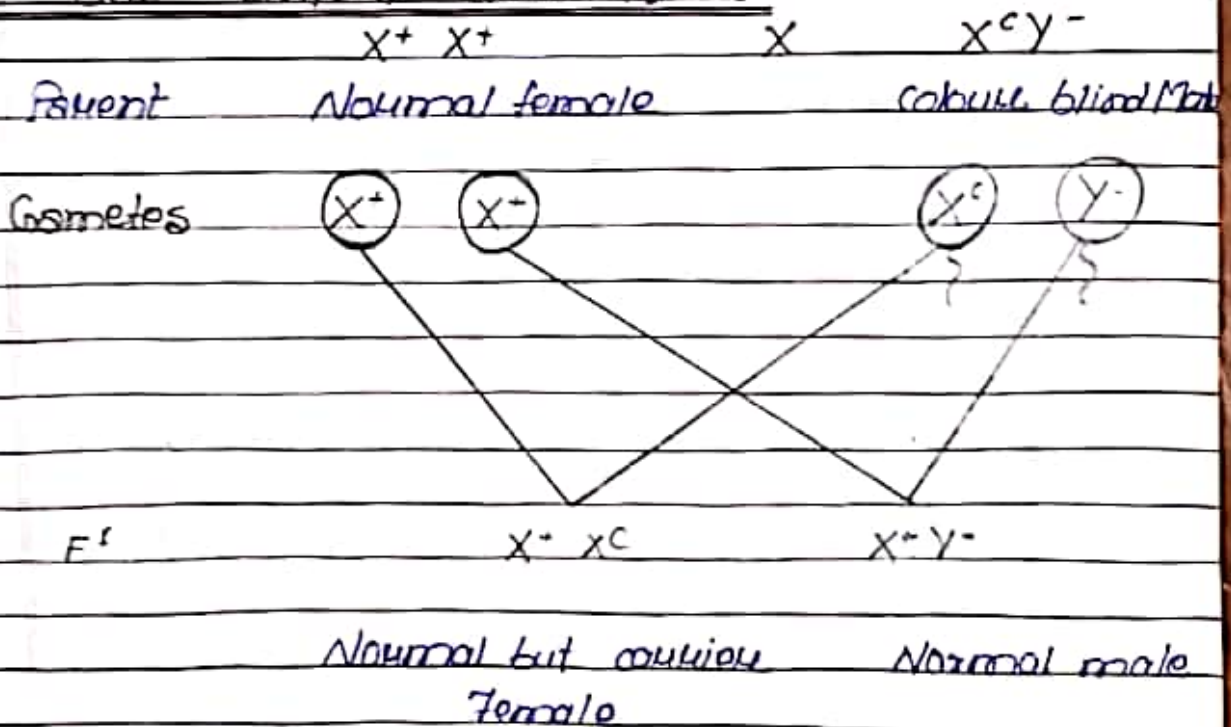
Date
Page No.

X chromosomes are inactivated in females.

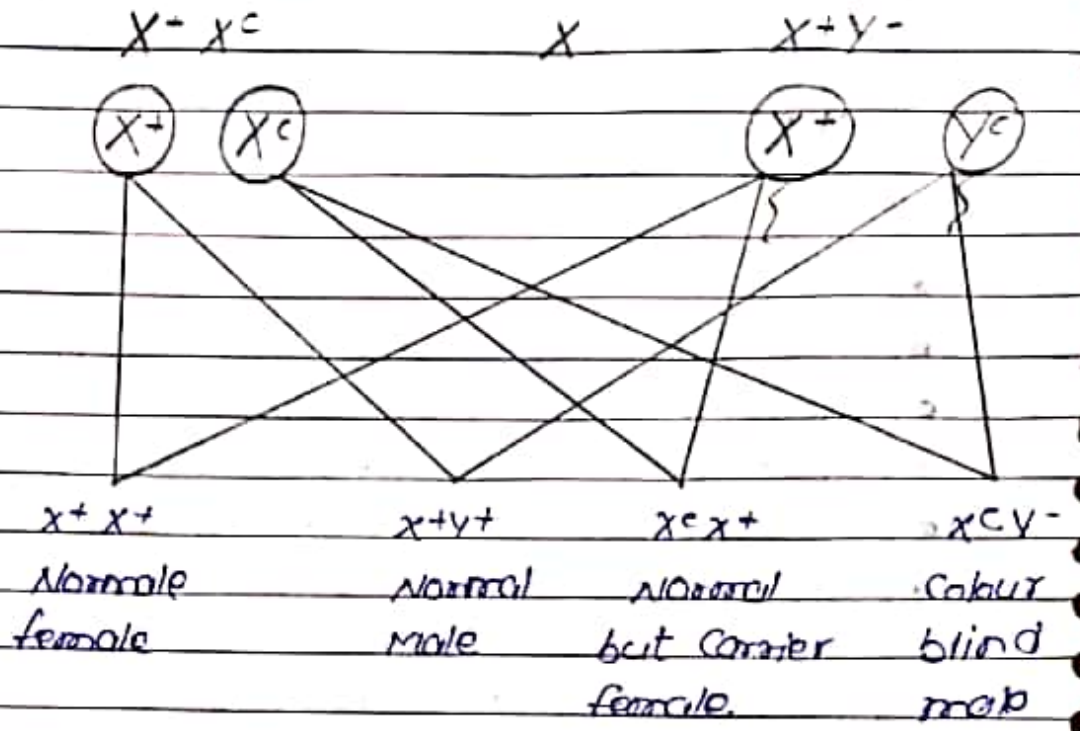
example :-

- Albright syndrome
- Coffin - lowry syndrome (CLS)
- Fragile X syndrome
- Idiopathic hypoparathyroidism
- Incontinentia pigmenti
- Rett syndrome (RS)
- Vitamin A resistant rickets (X-linked hypophosphatemia)

Sex linked Inheritance :-



Gametes



3. Normal vision : 1 carrier, color blind

Fig. 4.7. Marriage between colour blind man and normal visioned woman

Sex - influenced traits :-

Sex influenced or sex - conditioned traits are phenotypes affected by whether they appear in a male or female body. Even in a homozygous dominant or successive female the condition may not be expressed fully. example: baldness in humans.