**13 variant Sex-linked inheritance**

1. **№ 305.** When crossing a white male medaka aquarium fish with a red female (direct cross), all males and females of first generation turned out to be red. In F2, there were 117 red males of both sexes and 43 white males. In F1 of reverse cross, there were appeared 197 white males and 230 red females. How is the trait inherited? Determine the genotypes of the original fishes. What segregation would you expect to obtain in an F2 of reverse cross of 200 offspring?
2. **№ 335.** In Human, a hereditary allergic disease - hemorrhagic diathesis are causes by a recessive gene. Alleles of this gene are found in both sex chromosomes, X and Y chromosomes. Determine what kind of children and grandchildren will be if the parents:

a) the wife and all her ancestors are healthy, but the husband is sick; b) the husband and all his ancestors are healthy, but the wife is sick?

1. **Determine the genotypes of parental cats and explain results of crossing using genetic scheme.**

The female cat - fur is red and fluffy. This cat was homozygous by genotype.

The male cat – fur is black and smooth.

Six kittens were born from the crossing, all smooth-haired. Among them, there were three multicolored females and three red males.

Among kittens of F2, there were females and males of two types of colored fur, and only part of F2 progeny were fluffy

**Variant 33 – Population Genetics**

**№ 26.** Hereditary methemoglobinemia (high level of methemoglobin in the blood due to a defect of the enzyme diaphorase) is inherited as a recessive trait. In a population of Alaska Eskimo disease occurs with a frequency of 0.09%. Determine the frequency of heterozygotes in the population.

**№ 27.** In the population the incidence of disease associated with the homozygous state of one recessive gene is 1 from 400 persons. Determine the proportion of disease carriers and different genotypes frequencies.

**Variant 17 – Crossingover**

**№ 369.** When a female Drosophila with a gray body and normal bristles was crossed with a male that had a yellow body and split bristles, both females and males of F1 had a gray body and normal bristles. In the F1 of reverse cross, criss-cross inheritance was observed. And in F2, numerous offspring were obtained, among which 3% of flies had a gray body and split bristles or a yellow body and normal bristles. How can you explain these results? How are traits inherited? Determine the genotypes of the original flies and F1 hybrids of direct and reverse crosses, and draw a schemes of chromosomes with alleles.

**№ 374.** In Drosophila, in one experiment to study gene linkage, the following splitting in F2 was obtained:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | Females |  | Males |
| ABC | 248 | 2 |
| АВс |  | 37 |
| АbС |  | 28 |
| Abc |  | 171 |
| аВС | 252 | 190 |
| аВс |  | 26 |
| аbС |  | 42 |
| abc |  | 4 |
|  | 500 | 500 |

Determine the genotypes of the parents. Determine the location of genes on the chromosome and calculate the distance between them. Draw a chemes of chromosomes with alleles.