**PRACTICAL NO 2**

**STUDY OF MEIOSIS IN GRASSHOPPER TESTIS**

**What is meiosis?**

**Meiosis produces daughter cells that have one half number of chromosomes as the parent cell.**

**2N N**

**Meiosis enables organisms to reproduce sexually. Gametes (sperm and eggs) are haploid.**

**Meiosis involves two divisions producing a total of four daughter cells.**

**Summary of the phases of Meiosis:**

**The cell undergoing meiosis will divide two times; the 1st division is meiosis-I and the 2nd division is meiosis-II.**

**Materials**

**• Male grasshopper (no ovipositors)**



• Watch glass



• Forceps



• Microscope slide



• Coverslip



• 50% acetic acid

• 2% acetic orcein

• Filter paper

• Scalpel



• Microscope

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Procedure:

• Wash hands and put on gloves

• Obtain a male grasshopper.

• Anesthetize with CO2 (mix Alka Seltzer with water and collect CO2 in balloon).

• Remove the appendages.

• Make a dorsal incision along the abdomen.

• Look for brightly colored orange or yellow mass and carefully remove with forceps (these are the testes).

• Place the testes in a watch glass with a small amount of water.

• Add 2 drops of 2% acetic orcein to the watch glass.

• Tease the tissue into smaller pieces with forceps.

• Place a microscope slide on a paper towel.

• Place a small amount of tissue on the slide.

• Add 1 drop of 50% acetic acid to the slide.

• Add 1 drop of 2% acetic orcein to the slide.

• Place a coverslip on the slide.

• Cover the slide with filter paper.

• Roll your thumb over the coverslip and the filter paper. (This will squash the testes causing the nuclei to burst).

• Place the slide on the stage of a microscope and view the stages of meiosis.

• Clean work area with surface disinfectant. Remove goggles and gloves and wash hands.

• Draw and label the stages of meiosis observed from the slide.

**Observation**

**Meiosis I:** Interphase I, Prophase I, Metaphase I, Anaphase I and Telophase I.

**Interphase I –** DNA replication. Chromatin looks like “ball of yarn”.

**Prophase I -** Chromosomes coil and condense to form a tetrad (synapsis).

**Metaphase I -** Tetrads align along equator.

**Anaphase I** - tetrads split and dyads move to opposite poles.

**Telophase I –** Cleavage furrow forms as cell splits (cytokinesis) to form two haploid cells

**Meiosis II:** Interkinesis, Prophase II, Metaphase II, Anaphase II and Telophase II

**Interkinesis –** similar in appearance to interphase I without DNA replication.

**Prophase II –** chromosomes condense and coil.

**Metaphase II –** chromsomes align along the equator.

**Anaphase II –** dyads split at centromere and move to opposite poles.

**Telophase II -** cleavage furrow forms as cell splits (cytokinesis) to form two new cells for each haploid daughter cell (total of 4 haploid cells/ original cell).