Phytophagous mites generally occur on all plant parts as leaves, bark, buds, twigs, fruit, calyx or fruit surface or even on roots. A keen sense of observation and a close look to various plant parts is very necessary; owing to their minute size and tendency to remain obscure in plant tissues.

**COLLECTION**

**EQUIPMENT FOR THE COLLECTION**: Some simple equipment was carried to the fields, when the collection trips were arranged. This equipment included polythene bags, rubber bands, fine camel hair brushes, plastic tray, vials, hand lens, collection record book, camera with a close-up attachment and a large collection kit to hold this equipment.

**SURVEY AND DETECTION**

The incidence of mites was frequently seen on plants which showed white speckling, browning, curving, discoloured patches, rusting, blister or gall formation on the foliage. Hand lens was used to detect the presence of false spider mites. Plant parts infested with mites were collected in individual polythene bags. The mouth of the polythene bag was tightly closed by a rubber band. The locality, date of collection, colour of mite, symptoms induced, approximate extent of damage and altitude was recorded. The polythene bags containing infested material was kept away from the heat of the
sun. The material remained in good condition for 2 to 3 days. Spider mites were also collected by another method. The infested plant parts were beaten on a white plastic tray, mites dislodged and dropped into the tray. These were picked out by a brush and transferred into a preservative in the vials. Eriophyid mites were invisible in the field. Hence plants or plant parts suspected to retain these mites after examination of symptoms borne by them, were collected in individual polythene bags and put to microscopic examination in the laboratory. The leaf axils, leaf surfaces, outer and inner sides of bud scales, flower buds were thoroughly checked. The colour, shape and location were recorded when the eriophyids were detected on the plant material.

**EXTRACTION**

The plant material infested with eriophyids was cut into small pieces and put in 70% alcohol in petri dishes for 2 to 3 hours. The petri dishes were examined under binocular microscope and eriophyids were picked out with the help of an entomological needle.

The plant material infested with mites other than eriophyids were poured from polythene bags in the clean glass jars held in enamel trays filled with water. These jars were closed by a muslin cloth. Each jar was placed in the centre of the tray to prevent escape or contamination of mites. As the infested plant material began to dry, the mites came out through
the muslin cloth and were removed with the help of a soft camel brush. By applying this method, the immature stages of mites, other insect pests and predators also developed in the jars.

**PRESERVATION**

Eriophyids were preserved by two methods:

a. **WET METHOD:** The eriophyd mites were preserved in Keifer's preservative after extraction. Keifer's preservative was prepared by allowing 25% solution of isopropyl alcohol or ethanol in water to take up enough table sugar to become a thin syrup. Then a little iodine was added to tint the solution to increase its quality of preservation.

b. **DRY METHOD:** The well infested plant parts were selected and allowed to dry up in a paper envelopes with mouth closed by a rubber band or pins.

Other groups of mites were preserved in 75% alcohol and Oudeman's fluid. It was observed that storing of mites in 75% alcohol make them brittle. The mites remained in good condition in Oudeman's fluid and cleared easily at the time of mounting.

**SLIDE PREPARATION**

Clearing: Phytophagous mites excluding eriophyids were cleared before mounting in either of the two clearing agents given below:

a. **NESBITTS CLEARING AGENT:** The mites were transferred to cavity blocks and kept in the clearing agent for 24 hours. When the
mites did not acquire transparency during this time, the contents were gently warmed until required transparency of the material was acquired.

**FORMULA OF NESBITT'S CLEARING AGENT:**

- Chloral hydrate = 40 grams.
- Distilled water = 25 cc.
- Concentrated HCl = 2.5 cc.

b. LACTOPHENOL CLEARING AGENT: The best transparency of the specimens was obtained by treating them with Lactophenol. The specimens were kept in this clearing agent for 24 hours. When the mites did not reach to required transparency during this interval, the cavity blocks were kept on heating plate and gently warmed to hasten the process.

**FORMULA OF LACTOPHENOL CLEARING AGENT:**

- Lactic acid = 45 parts
- Phenol crystals = 30 parts
- Water = 25 parts

**MOUNTING**

I. TEMPORARY MOUNTING: Specimens were mounted in 75% Lactic acid in a cavity slide for the preliminary observation.

II. PERMANENT MOUNTING:

- POLYVINYL ALCOHOL LACTOPHENOL MEDIUM; This mountant
was prepared as under:

1. One volume of polyvinyl alcohol was dissolved into four volumes of water and continuously stirred at 85°C.

2. Filterate was concentrated on a water bath until it reached to a required viscosity.

3. A mixture of Lactic acid 22 parts, Phenol crystals 12 parts and water 12 parts was prepared separately.

4. Fifty four parts of Polyvinyl alcohol concentrate was added to this mixture slowly and stirred till a homogeneous mixture was obtained.

Although good results were obtained by mounting the mites in this medium in summer yet the slides did not gave a clear expression under microscope at low temperatures in winter.

b. **HOYER’S MEDIUM**: Best results were obtained by mounting the specimens in Hoyer’s medium. This mountant was found fit under Kashmir conditions. This mountant was prepared as under:

1. 32 grams of clear crystals of gum arabic were dissolved in 50 grams of water.

2. Twenty grams of Glycerine were added to 212 grams of Chloral hydrate.

3. Two mixtures were mixed and the final product was filtered through the muslin cloth.

**PROCEDURE FOR MOUNTING**: The specimens were picked out from the clearing agent and washed 3 to 4 times. A drop of Hoyer’s mountant was placed on the centre of a micro slide. A specimen was picked out by a fine needle and placed in it. A coverslip was
was placed gently on the specimen. The coverslip was encircled by a drop of Hoyer's to seal it. The males of spider mites were mounted laterally to study aedeagus whereas other specimens were mounted dorsally and ventrally. The slides were marked by a glass marker and kept in oven at 40-45°C for four days up-to a week till they dried completely.

MOUNTING OF ERIOPHYID MITES: The eriophyid mites were first cleared by warming them gently in a clearing agent:

- Chlora hydrate = 80 gms.
- Glycerine = 10 gms.
- Distilled water = 50 gms.
- Concentrated HCl = 2 CC

When the mites became transparent, they were picked up by a fine needle to give a wash in Hoyer's media in a cavity slide. They were then transferred to a drop of Hoyer's mountant on the slide. The coverslip was encircled by a drop of Hoyer's and kept for 3 to 5 days in the oven at a temperature of 20°C.

ILLUSTRATIONS AND MEASUREMENTS

The mites were studied under different magnifications and illustrated by line sketches giving precise view of structures of taxonomic importance with the help of a camera lucida. A zoom lens with the high magnification proved highly useful. Minute structures were studied under oil emulsion and measurements were taken with the ocular and stage micrometers.