The requirement to improve the common pistachio psylla (CPP) pest control is to increase the speed of its population monitoring at low densities. Since controlling the population of this pest at low densities is more economical and practical, it is noteworthy that the utilization of compounds with low-density control purposes poses reduced risks to human health. One of the ways to achieve this goal is the use of artificial intelligence. Intelligent control and monitoring of the CPP population, which is the most important pest of the pistachio crop requires training different machine vision algorithms such as R-CNN, Faster R-CNN, RetinaNet, and YOLO. Training each of these machine vision algorithms requires a standard image dataset, which is time-consuming to prepare. Therefore, in this project, we will prepare a standard image dataset to improve the intelligent process of monitoring the CPP population in pistachio orchards. In this project, 1000 raw photos are first taken with a resolution of 3472 x 3472 pixels of infested leaves with two simple backgrounds: a black background and a complex background containing other leaves, soil, sky, etc. In image pre-processing, first, the photos will be converted to 3200 x 3200 pixels size and then cropped with 5 x 5 dimensions and converted into 640 x 640 pixel subsets. Then, these subsets, are annotated into three classes nymph 1-2, nymph 3-4, and nymph 5. To enrich the dataset, image processing techniques such as light adjustment, random cutting, a random combination of images, scene change, etc are applied. Also, the mosaic9 technique will be used to enrich the background of the images. After the pre-processing of the images, to measure the quality of the created image dataset, models will be built using the standard Yolo5 algorithm and its performance on this dataset will be reported.

Keywords

Image dataset, pistachio common psylla pest, machine vision

Aims

1- Creation of a standard image dataset for common pistachio psylla pest.

2- Contributing to the smartization process of pistachio psylla population monitoring in pistachio orchards.