S1_Carob moth biological background

Carob moth

The carob moth, *Ectomyelois ceratoniae* (Zeller) (Lepidoptera: Pyralidae), is a destructive polyphagous pest worldwide that attacks the fruits of a variety of commercially important plants before and after harvest. In addition to the species mentioned in the main paper Pistachio [*Pistachia vera* L. (Anacardiaceae)] is another major host of this insect in the Middle East [1-4]). *Ectomyelois ceratoniae* has 4-5 generations per year on pomegranate in the field in the Middle East [5] . Previously, it was shown that delta sticky traps baited with pomegranate fruits of different stages of fruit ripening caught male and female carob moths in the field [4] .

Sex pheromones

Since the egg-laying and larval feeding activity occur within the fruits and are thus hidden from the outside world, commercial insecticides are not efficient and thus not used against this pest insect. In addition, an efficient sex pheromone attractant is still lacking in carob moth pest management. In moth pests, long-range female sex pheromones are well established in pest management programs for monitoring, mass-trapping, and mating disruption [6]. The major female sex pheromone component [(*Z,E*)-9,11,13-tetradecatrienal] is unstable [7] , which is the reason that a stable mimic of this component, viz., (*Z,E*)-7,9,11-dodecatrienyl formate, is used in commercial sex pheromone lures. However, these lures are not efficient in pomegranate orchards in the Middle East [8,9] .

Insect- plant interactions

Insects synchronize their life cycle with that of their host plant to optimize food intake and enhance their growth rate [10,11] . Synchronization can be achieved when insects respond to signals that are specific to different phenological stages or parts of the host plant [12] . Phenological stage is known to affect insect attraction and oviposition behaviour via different chemical cues [13-18]. Different plant parts of the same phenological stage may also emit distinctly different volatile blends [18-20]). Individual plant volatiles are not always specific, and in fact many of them are common to most plant species. Host attraction is likely encoded by a specific blend of host-plant volatiles, comprising both attractants and repellents. At high concentrations, an attractive host plant volatile may become unattractive or even repellent to the herbivorous insect [21-24] Males, virgin females, and gravid females may respond differently to host-plant volatiles, as the threshold and ultimate outcome of the response of insects to plant volatiles is determined by the integration of external stimuli with the internal physiological state of the insect [22, 25-27].

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