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Abstract

Powdery mildew has recently become a serious problem threatening safflower in its growing areas in Egypt. The disease mainly attacks leaves and stems, and infection may extent to inflorescences, causing heavy losses. The disease was widespread in the areas surveyed. However, its severity varied between these regions, as it was severe in Qena, followed by Beni-Suef and less severe in Fayoum. Based on the morphological characteristics of the anamorphic stage, the causal agent of safflower powdery mildew (SPM) was identified as *Golovinomyces cichoracearum* (DC.) V.P. Heluta. In this study, we tested the activity of ethanolic propolis extract (EPE), diluted honey solution (DHS), and clove essential oil (CEO), individually or in mixtures against SPM in in vitro and in vivo. All treatments significantly reduced conidial germination of *G. cichoracearum* in vitro. Maximum reduction was achieved by EPE (50%) + CEO (3 mL/L), followed by EPE (50%) + DHS (50 g/L) and DHS (50 g/L) + CEO (3 mL/L) as follows: 90, 87.3, and 80.1%, respectively. While the lowest reduction was recorded by DHS (50 g/L). In the greenhouse, all treatments significantly reduced disease severity and area under the disease progress curve (AUDPC). The mixture treatments were more efficient than the individual treatments. Similar results were obtained in the field during two successive seasons. The reduction in disease severity was expressed by improved growth, yield, photosynthetic pigments, and anatomical characteristics of the plant. In general, EPE, DHS, and CEO can be successfully used to control powdery mildew and improve growth and productivity in safflower.

عميد الكلية

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