

PHYTOPLASMA DISEASES OF FRUIT TREES AND GRAPEVINE IN SOUTHERN ITALY

(PROGETTI DI RICERCA DI RILEVANTE INTERESSE NAZIONALE – BANDO 2022 PNRR)

In southern Italy, phytoplasma diseases of fruit trees and grapevine are widespread. These diseases, whose causal agents are quarantine pathogens, are economically much more important than previously thought and do considerably reduce yield and quality of crops and longevity of plants. Their widespread occurrence may be related to several factors including the reduced applications of broad-spectrum insecticides whereas insect control and/or management by other environmentally-friendly means is not fully satisfactory. In addition, the lack of prolonged low winter temperatures due to global warming allow greater survival of insect vectors and consequently more severe disease outbreaks during the growing season. Of the various crops, apricot, Japanese plum, peach and almond are considerably affected by European stone fruit yellows (ESFY), a major disease of stone fruits in Europe and neighbouring Mediterranean regions. Recently, almond witches'-broom (AlmWB), a lethal disease of almond and other stone fruits, which is widespread in Lebanon and Iran, has been reported to affect almond trees in Apulia region with a disease incidence of 25%. In most pear fruit growing areas of southern Italy, pear is affected by pear decline (PD) disease whereas in Basilicata region, a high percentage of apple trees affected by apple proliferation (AP) disease, reaching more than 50% in some locations, has been recorded in low-intensity orchards where apple trees were not or rarely treated with insecticides. Also, ESFY, PD and AP phytoplasmas have been identified in singly and multiply infected European hazel trees showing symptoms of yellowing and decline in Campania region. Many aspects of the mentioned diseases including genetic variability of the causal agents, strain differences, insect vectors and alternative plant hosts have not been investigated in southern Italy. Knowledge of these aspects is essential for development of effective disease management measures. Of the grapevine yellows (GY) diseases, bois noir (BN) has been reported from all southern Italian regions whereas flavescence dorée (FD) has been identified in Campania. Although *Scaphoideus titanus*, the FD vector, has been recorded in some regions of southern Italy, the vectorship of GY diseases in southern Italy as well as other relevant biological and molecular traits are unknown. Major objectives of the present project are: (i) improve knowledge on current distribution, economic and ecological impact of phytoplasma diseases of fruit trees and grapevine in southern Italy and taxonomic position of the associated phytoplasmas, (ii) elucidate the genetic variability of fruit tree and grapevine phytoplasmas, (iii) identify insect vectors and alternative plant hosts of fruit tree and grapevine phytoplasmas, and (iv) determine phytoplasma titer and colonization behavior in affected stone fruit and pome fruit trees. Results obtained from the project are basic requirements for appropriate disease management.

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