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SIGNIFICANT LEVELS OF PHENOTYPIC AND GENETIC VARIATION FOR ERIOPHYOID MITE CONTROL IS PRESENT IN HAZELNUT (*CORYLUS AVELLANA* L.) CULTIVATED ACCESSIONS AND BREEDING POPULATIONS

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Eriophyoid mites are obligate plant parasites that feed on various plant organs of many fruit tree species causing bud swelling and/or physiological disorders. The big bud eriophyoid mite *Phytoptus avellanae* (Nalepa) (*Pa*) is considered a pest of hazelnut trees (*Corylus avellana* L.) grown in southern Europe and elsewere. The chemical control of *Pa* require the use of acaricides with long residual activities to cope with the long appearance time of the adults from the hiding sites, in the big bud-galls, to search the new bud-shelters formed during spring. Chemical control is not environmentally friendly and may cause the surge of mite strains that have developed resistance to acaricides. Biocontrol of *Pa* by predatory mites is feasible but no suitable IPM protocols for reducing *Pa* population size in Italian orchards have been developed yet.

A sustainable *Pa* control strategy may be based on hazelnut host plant resistance. Several reports have indicated resistance to *Pa* in hazelnut accessions such as 'Mortarella' and 'Barcelona'. No information are available on: (*i*) the degree of resistance to *Pa* in other Italian hazelnut accessions, (*ii*) the genetic basis of the resistance, and (*iii*) the opportunity for breeding new clonal varieties endowed of resitance to the mite pest.

Observations on the incidence of mite infestation were made before bud sprouting for three years, when the big-buds were easily seen on the terminal stems of the trees of Tonda Gentile Romana (TGR), Tonda Gentile delle Langhe (TGL), Tonda di Giffoni (TGif), S. Giovanni, Nocchione, Nociara, Longue d'Espagne, Karidati, and Sivri accessions, their half-sib (HS) progenies, and the full-sib (FS) progeny from the TGR x Nocchione hybridization. Incidence was estimated by counting total buds and big-buds on 3 two-year old stems per tree, and expressing the infestation incidence (InIn) as percentage of the big-buds over the total buds.

Alternate scions of TGR, TGif and Nocchione were planted in replicated adjacent rows, to design triangular replicated plots, each including one tree from the three accessions, in order to control sources of variation that affected the trees within the same replicate. The interval of variation for 'InIn' over 20 replicates evaluated in two years, ranged from 0 to 3% in Nocchione, 12 to 24% in TGR and 32 to 61% in TGif. This indicated clear genetic differentiation among the tested accessions. The average 'InIn' from trees of TGR, TGL, TGif, S. Giovanni, Nocchione, Nociara, Longue d'Espagne, Karidati, and Sivri evaluated for three years (2008, 2009, and 2011), consistently indicated a near 0% 'InIn' in Longue d'Espagne, Nocchione, Nociara, and Karidaty, and over 17% 'InIn' for TGif, TGL and Sivri. Out of 96 FS plants evaluated for three years, 8 plants had consistently 0% 'InIn' and 8 over 25% 'InIn'. These results suggested a significant level of genetic variation for big-bud mite control in hazelnut germplasm collection and breeding

populations. The resistance to big-bud mite can be a further and feasible criteria to be used for selecting new clones from FS progenies.