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COMPARING CHESTNUT CULTIVARS AND THE WILD-TYPE FOR THEIR SUSCEPTIBILITY TO THE NUT ROT CAUSED BY *GNOMONIOPSIS CASTANEA*

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The emerging nut rot caused by the fungal pathogen *Gnomoniopsis castaneae* stands among the most detrimental threats to chestnut (*Castanea* spp.). The goal of this study was comparing a large selection of chestnut cultivars and the wild-type of *C. sativa* for the levels of susceptibility to *G. castaneae*. In 2013, up to 40 nuts per tree were collected from 85 chestnut cultivars and from the wild-type growing in the Chestnut Regional Repository of Chiusa Pesio (Italy). The sampling was partially replicated in 2014 for validation purpose. Isolation trials and molecular analyses were performed to assess the incidence of *G. castaneae* at tree level. The incidence of each cultivar was compared to the incidence of the wild-type, assumed as reference population, through an innovative approach based on the Pearson system of generalized frequency curves and on Monte Carlo simulations. In the wild-type, the incidence of *G. castaneae* increased from 2013 (4.8%) to 2014 (19.6%) and a similar trend was also observed, on average, in the chestnut cultivars (up to +29.7%). Cultivars significantly more susceptible ($P < 0.05$) than the wild-type (22% of the total number of cultivars in 2013 and 55% in 2014) were detected by definite integration of curves associated with the Pearson system. The validation analysis revealed no significant association between the most susceptible cultivars detected in 2013 and 2014 (odds ratio 2.85; 0.18-176.61 95% CI), suggesting that the susceptibility to *G. castaneae* is substantially homogeneous between the chestnut cultivars and the wild-type.