RESUMO GERAL DA TESE
Caracterização fenotípica e molecular de *Phytophthora capsici* de hortaliças e expressão e prospecção da resistência em *Cucurbitaceae* e *Solanaceae*.

THESIS ABSTRACT
Phenotypic and molecular characterization of *Phytophthora capsici* from vegetable crops and search and expression of genetic resistance in *Cucurbitaceae* and *Solanaceae*

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This thesis describes (a) the diversity of *Phytophthora* isolates from vegetable crops in Brazil using phenotypic and molecular markers and (b) the distribution and identification of resistance in *Lycopersicon* spp., *Cucurbita* spp., and *Cucumis melo*. In addition, the effect of plant phenology on the expression of host genetic resistance was studied and, finally, new hosts were identified. Characterization studies were conducted in a collection of 193 isolates from *Capsicum annuum, Lycopersicon esculentum, Cucurbita spp., Solanum melongena, Solanum gilo, Piper nigrum, Theobroma cacao* and *Hevea brasilensis,* all collected from widely separated geographic areas in Brazil. The morphology and morphometrics of sexual and assexual structures, compatibility group, metalaxyl resistance, pathogenicity, aggressiviness and virulence to sweet pepper fruits and to sweet pepper and tomato plantlets were studied, and compared to molecular data derived from the sequencing of ITS region and the 5.8S gene. All isolates studied had clavate piriform to lemoniform sporangia, with pedicels varying from 38 to 45 µm and stelate to rosiform colonies. Morphologic and physiologic characterization of isolates demonstrated that most of them conformed to the taxon *P. capsici*, with a few exceptions. The most prevalent compatibility group was A1, while the group A2 prevailed in the southern region. Results indicate that sexual reproduction is presently rare in Brazil. Most isolates were sensitive to metalaxyl in low dosages. Effective dosage for 50% inhibition of mycelial growth was 1.39 µg.mL^{-1} for isolates classified as sensitive, and 15.08 µg.mL^{-1} for isolates grouped as of intermediate sensitivity to metalaxyl. No isolate was classified as resistant. High prevalence of sensitive isolates may be due to the fact that, in Brazil, metalaxyl was not as widely used as a single active principle against oomycetes, as compared to other countries were resistance is more commonly found. Southern region isolates were the least sensitive to metalaxyl. All isolates tested were pathogenic to sweet pepper fruits, but some (the *Hevea brasiliensis* isolate) were less aggressive. Generally, however, aggressiveness to sweet pepper fruits had no relation to the host that the isolate was originally found. All isolates were pathogenic to sweet pepper plantlets, but varied in their aggressiveness to different pepper and tomato cultivars. All isolates were highly aggressive to tomato genotypes, including the isolates from sweet pepper. The isolate from *Piper nigrum* (Pci 8) was virulent to tomato and pepper plantlets, but its aggressiveness was lower than the others´. ITS 2 sequencing confirmed morphological data, separating the isolates in three taxa: 1) *P. capsici*, 2) *P. nicotianae,* and 3) *P. tropicalis*. Sequence homology and phylogenetic analysis supported separation of *P. tropicalis, P. nicotianae* and *P. capsici,* and the majority of isolates was identified as *P. capsici*. All three species are classified as crown and fruit pathogens of vegetable crops. Pathogenicity, aggressiviness and virulence of isolates were different in fruits and plantlets.

In the second part of the thesis, 152 genotypes of *Lycopersicon*, 376 genotypes of *Cucurbita* and 74 genotypes of *C. melo* were inoculated with 2 *P. capsici* isolates from compatibility groups A1 and A2. Inoculation was performed by deposition of a 3 mL zoospore suspension of 5.10^4 zoospores/mL in the plantlet crown. Disease incidence was evaluated at three points in time. In other experiments, the reaction of 41 commercial cultivars of *Cucurbita, Citrullus lanatus, C. melo, Lycopersicon* and *Capsicum annuum* inoculated 10, 20, 30 and 40 days after planting was examined. Finally, the susceptibility of 19 accesses of native *Cucurbitaceae* and *Solanaceae* were studied. Reaction of *Lycopersicon* to *P. capsici* was differentiated by host species: *L. peruvianum* genotypes were mostly susceptible, while *L. esculentum* genotypes were more frequently resistant. Significant levels of resistance were not detected among *Cucurbita* accesses, and, apparently, the expression of resistance against *P. capsici* in *Cucurbita* varies with the environment. Among all Cucurbitaceae studied, the genus *Cucumis* had most genotypes resistant to *P. capsici*. Among the three *Cucurbita* species evaluated, *C. moschata* had the higher number of resistant genotypes. Most critical period for *P. capsici* infection of all hosts studied was 10-15 days after planting (dap). When inoculated 10 dap, commercial cucurbitaceous and solanaceous genotypes were usually (69%) classified as susceptible (S); at 20 dap, genotypes were more evenly distributed as resistant (R, 40%) and S (44%); finally, after 30 dap, 56% of the genotypes were classified as R. New hosts of *P. capsici* identified in this study, following artificial inoculation, are *Sicana odorifera*, *Nicandra physaloides*, *Capsicum praetermissum*, *Cyphomandra betacea*, *Solanum paniculatum*, and *Solanum americanum*.