



# Morphological and genetic relationships between wild and domesticated forms of peppers (*Capsicum frutescens* L. and *C. chinense* Jacquin)

S.I.C. Carvalho<sup>1,2</sup>, C.F. Ragassi<sup>2</sup>, L.B. Bianchetti<sup>3</sup>, F.J.B. Reifschneider<sup>4</sup>, G.S.C. Buso<sup>3</sup> and F.G. Faleiro<sup>1,5</sup>

<sup>1</sup>Faculdade de Agronomia e Medicina Veterinária, Universidade de Brasília, Brasília, DF, Brasil

<sup>2</sup>Embrapa Hortaliças, Brasília, DF, Brasil

<sup>3</sup>Embrapa Recursos Genéticos e Biotecnologia, Brasília, DF, Brasil

<sup>4</sup>Embrapa Relações Internacionais, Brasília, DF, Brasil

<sup>5</sup>Embrapa Cerrados, Brasília, DF, Brasil

Corresponding author: S.I.C. Carvalho

E-mail: [sabrina.carvalho@embrapa.br](mailto:sabrina.carvalho@embrapa.br) / [sabrinacarvalho.carvalho@gmail.com](mailto:sabrinacarvalho.carvalho@gmail.com)

Genet. Mol. Res. 13 (3): 7447-7464 (2014)

Received July 22, 2013

Accepted January 10, 2014

Published September 12, 2014

DOI <http://dx.doi.org/10.4238/2014.September.12.11>

**ABSTRACT.** *Capsicum chinense* and *C. frutescens* peppers are part of the Brazilian biodiversity, and the Amazon basin is the area of greatest diversity for them, especially for that former species. Nevertheless, little is known about their evolutionary history. Aiming to identify genotypes with wild and domesticated characteristics, 30 accessions of the germplasm bank of Embrapa were characterized using morphological descriptors and ISSR molecular markers. Of the 72 primers tested, 42% showed amplification and produced 136 amplicons with some of the primers, namely i7Pv and i57Zm, allowing the identification of each

species. ISSR also revealed polymorphisms within a species, especially between domesticated and wild forms. Four wild accessions collected in the Amazon region (CNPH 4315, CNPH 4372, CNPH 4337 and CNPH 4325B) popularly known as “olho-de-peixe” or “olho-de periquito” were molecularly classified as *C. chinense* and showed fruit with similar characteristics as the wild species: upright position, rounded to campanulate shape, small size (1.0 cm long and 0.8 cm wide), average weight of 0.2 g, dark-red color when ripe, easy detachment of calyx and presence of calyx annular constriction (discriminative of *C. chinense*). The wild form CNPH 4353 known as “malaguetinha” was morphologically and molecularly classified as *C. frutescens*, demonstrating a more preserved morphology in *C. frutescens* than in *C. chinense*. A significant correlation was found between morphological and molecular characterization, and the combination of the two analyses was effective in identifying and classifying the wild forms and contributing to evolutionary studies in the genus.

**Key words:** Molecular characterization; Domestication; ISSR; Morphological characterization; Diversity; Germplasm bank