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Tracing the origin of the rocoto chile (*Capsicum pubescens*): insights through RAD-seq data

C. CARRIZO GARCÍA^{1,2}, N. PALOMBO¹, H. SCHNEEWEISS²

¹Department of Botany and Biodiversity Research, University of Vienna, Rennweg 16, A-1030, Vienna, Austria; ²Multidisciplinary Institute of Vegetal Biology, Av. Velez Sarsfield 1611, 5000, Córdoba, Argentina

The hot chile *Capsicum pubescens* is cultivated mainly in the highlands of Central-South America. Unlike other cultivated chiles, *C. pubescens* is known only as a cultigen and not in the wild. The affinities and origin of this species are puzzling; the ‘purple species’ from central Andes have been proposed as its ancestors but *C. pubescens* forms an isolated monotypic clade in phylogenetic reconstructions. To better understand *C. pubescens* origin and affinities, the RAD-sequencing approach was followed using samples from *C. pubescens*, the ‘purple species’, and other species across *Capsicum*. The data filtered were analysed by Maximum Likelihood methods. A highly resolved phylogenetic reconstruction was obtained. *Capsicum pubescens* samples are resolved as a monophyletic group, sister the ‘purple species’, which in turn form a strong monophyletic group; this assemblage is sister to the clade that includes the other cultivated chiles and their wild relatives, altogether in the most derived branches of *Capsicum*. In contrast to previous studies, by using data from the whole genome it is proposed that *C. pubescens* is not an isolated lineage but closely related to the ‘purple species’, although they are clearly distinct clades, therefore none of the latter or any extant species would be its ancestor.