

A molecular study of *Neophyllaphis varicolor* (Hemiptera, Aphididae) in Costa Rica

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Abstract

The genus *Neophyllaphis* (Takahashi) (Aphididae: Neophyllaphidinae) is composed of 18 species; however, in the Americas only nine species have been reported previously. A new species, *Neophyllaphis varicolor* Miller & Halbert, was described in 2014 in USA. Colonies resembling those of this new species have been observed in Costa Rica on *Podocarpus* spp. In order to determine if *N. varicolor* is also present in Costa Rica, we sampled *Neophyllaphis* colonies from *Podocarpus falcatus* and *P. chinensis*. Additionally, we sampled individuals from *Podocarpus* sp. in Spain and Vietnam. DNA of each sample was extracted and used to amplify and sequence the cytochrome *c* oxidase subunit I (COI) and elongation factor I (EF-1 α) partial regions. According to morphological characteristics, sequences comparisons done in GenBank and BOLD, and phylogenetic analyses, the colonies collected from *Podocarpus* spp. in Costa Rica and the colony from Vietnam corresponded to the species *N. varicolor*. To the best of our knowledge this is the first report of the presence of *N. varicolor* in Central America and Vietnam.

Keywords

Aphids, cytochrome *c* oxidase subunit I, DNA barcoding, elongation factor I, integrative taxonomy, phylogenetic analysis, *Podocarpus*