

## Nuclear Mitochondrial Pseudogenes in *Anastrepha fraterculus* Complex

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**Abstract :** Exotic, invasive tephritid fruit flies (Diptera: Tephritidae) are a major threat to fruit and vegetable industries in the United States. The establishment of pest fruit fly in the agricultural industries and produce severe ecological and economic impacts on agricultural diversification and trade. Detection and identification of these agricultural pests in a timely manner will facilitate the possibility of eradication from newly invaded areas. Identification of larval stages to species level is difficult, but is required to determine pest loads and their pathways into the United States. The aim of this study is the New World genus, *Anastrepha* which includes pests of major economic importance. Mitochondrial cytochrome c oxidase I (COI) gene sequences were amplified from *Anastrepha fraterculus* specimens collected from South America (Ecuador and Peru). Phylogenetic analysis was performed to characterize the *Anastrepha fraterculus* complex at a molecular level. During phylogenetics analysis numerous nuclear mitochondrial pseudogenes (numts) were discovered in different specimens. The numts are nonfunctional copies of the mtDNA present in the nucleus and are easily coamplified with the mitochondrial COI gene copy by using conserved universal primers. This is problematic for DNA Barcoding, which attempts to characterize all living organisms by using the COI gene. This study is significant for national quarantine use, as morphological diagnostics to separate larvae of the various members remain poorly developed.

**Keywords :** tephritid, *Anastrepha fraterculus*, COI, numts

**Conference Title :** ICE 2017 : International Conference on Entomology

**Conference Location :** Paris, France

**Conference Dates :** October 19-20, 2017