



## A study of the scale insect genera *Puto* Signoret (Hemiptera: Sternorrhyncha: Coccoidea: Putoidae) and *Ceroputo* Šulc (Pseudococcidae) with a comparison to *Phenacoccus* Cockerell (Pseudococcidae)

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### Abstract

For almost a century, the scale insect genus *Puto* Signoret (Hemiptera: Sternorrhyncha: Coccoidea) was considered to belong to the family Pseudococcidae (the mealybugs), but recent consensus accords *Puto* its own family, the Putoidae. This paper reviews the taxonomic history of *Puto* and family Putoidae, compares the morphology of *Puto* to that of *Ceroputo* Šulc and *Phenacoccus* Cockerell, and reassesses the status of all species that have been placed in *Puto* to determine whether they belong to the Putoidae or to the Pseudococcidae. For 49 of 57 species that have been placed in *Puto*, as listed in the online database ScaleNet, we score and tabulate features that are diagnostic for Putoidae and then list all species in their correct family placement. For comparison, we include a few species of Pseudococcidae, namely five species of *Phenacoccus*, including the type species *Phenacoccus aceris* (Signoret), and the type species of *Ceroputo*, *C. pilosellae* Šulc. We provide revised synonymy lists for *Puto* and *Ceroputo*, a brief diagnosis of each genus, synonymy lists and notes for several species for which we suggest recombinations or additional synonyms, or for which we have additional data on morphology. We provide a brief diagnosis of *Phenacoccus* for comparison with *Ceroputo* and *Puto*. As a result of our study, we recognise 47 extant and two fossil species of *Puto*, and six species of *Ceroputo*. The New World species *Puto mimicus* McKenzie and *Puto nulliporus* McKenzie are transferred to the mealybug genus *Ceroputo* as *Ceroputo mimicus* (McKenzie) **comb. nov.** and *Ceroputo nulliporus* (McKenzie) **comb. nov.**, respectively, and the Old World species *Puto pini* Danzig and *Puto vaccinii* Danzig are recognised as *Ceroputo pini* (Danzig) **comb. rev.** and *Ceroputo vaccinii* (Danzig) **comb. rev.**, respectively, in agreement with Tang (1992). The Old World species *Puto graminis* Danzig is transferred to *Ceroputo* as *Ceroputo graminis* (Danzig) **comb. nov.** Based only on a study of the literature, the following two names are treated here as junior subjective synonyms of *Ceroputo pilosellae*: *Phenacoccus asteri* Takahashi **syn. nov.** and *Puto jarudensis* Tang **syn. nov.** We agree with Tang (1992) that *Leococcus erigeroneus* Kanda should be treated as a junior subjective synonym of *C. pilosellae* and thus the genus name *Leococcus* Kanda, erected for *L. erigeroneus* and formerly treated as a junior synonym of *Puto*, is a junior synonym of *Ceroputo*.

**Key words:** archaeococcoids, neococcoids, mealybug, taxonomy

### Introduction

The name *Puto*, proposed by Signoret (1876), was a replacement name for the occupied name *Putonia* Signoret, a genus described for the single species *Putonia antennata* Signoret from France by Signoret (1875). At present, the genus *Puto* has a distribution comprising the Palaearctic Region (with an extension into the Oriental Region) and the New World (ranging from near the Arctic Circle to the Neotropical Region). Old World and New World species