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## A New Species of Seed-harvester Ant, *Pogonomyrmex hoelldobleri* (Hymenoptera: Formicidae), from the Mohave and Sonoran Deserts of North America

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### Abstract

*Pogonomyrmex magnacanthus* Cole was described as a distinct species; unusually large eyes and a high ocular index (maximum eye diameter/head width) were listed as diagnostic characters. However, examination of numerous series of *P. magnacanthus* revealed that both characters were highly variable, and that these series consisted of *P. magnacanthus* plus an undescribed species, *Pogonomyrmex hoelldobleri* Johnson, Overson & Moreau sp. nov. This paper describes all three castes of *P. hoelldobleri* as well as the alate queen of *P. mohavensis*, which is very similar to that of *P. hoelldobleri*. A molecular phylogeny that consisted of 3,703 bp from one mitochondrial and five nuclear gene fragments supported the monophyly of *P. hoelldobleri*, *P. magnacanthus*, and *P. mohavensis*. *Pogonomyrmex magnacanthus* can be separated from other *P. californicus* group species based on: (1) its unusually large eyes, (2) a high ocular index, and (3) a malar ratio that is typically  $\leq 1.0$ . *Pogonomyrmex hoelldobleri* can be separated from other *P. californicus* group species based on the combination of: (1) eyes not unusually large, (2) cephalic rugae not forming circumocular whorls, but rather converging posterior to the eyes, usually near the vertex, (3) mandible with seven teeth, and (4) interrugal spaces on pronotal sides moderately to strongly granulate, dull to weakly shining. *Pogonomyrmex mohavensis* can be separated from other *P. californicus* group species based on the combination of: (1) eyes not unusually large, (2) cephalic rugae not forming circum-ocular whorls, but rather extending more or less directly to the vertex or converging only slightly near the vertex, (3) mandible with six teeth (a seventh sometimes occurs as a denticle between the basal and sub-basal teeth), and (4) interrugal spaces on pronotal sides smooth and shining to weakly punctate and moderately shining. We also provide field observations and distribution maps for *P. magnacanthus*, *P. hoelldobleri*, and *P. mohavensis*, and an updated key to *P. californicus* group species that occur in central and western North America.

**Key words:** DNA phylogeny, Mohave Desert, new species, *Pogonomyrmex*, *P. californicus* group, Sonoran Desert

### Introduction

The seed-harvester ant genus *Pogonomyrmex* Mayr, 1868 is a New World group that consists of approximately 67 described species (Bolton, 2012) that occur throughout most of North and South America, and also on the island of Hispaniola. Throughout much of the American West, Mexico, and southern South America, these are ecologically dominant ants, especially in arid habitats. Modern study of the genus began with Cole's (1968) revision of North American species, which stabilized the taxonomy of the genus and set the stage for studies of ecology, biogeography, territoriality, mating behavior, communication, caste determination, and foraging behavior that have greatly facilitated our understanding of ant biology (Anderson *et al.*, 2006; Cole & Wiernasz, 1999; Gordon, 1995; Johnson, 2000, 2001; Taber, 1998; Wiernasz *et al.*, 2001). Influential research on *Pogonomyrmex* also was conducted by Dr. Bert Hölldobler, whose numerous pioneering studies on this genus were likely responsible for *Pogonomyrmex* becoming one of the best studied and most well understood genus of ants (Gadau *et al.*, 2003;