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## Description of a new species and species-group of *Sphaerophthalma* Blake (Hymenoptera: Mutillidae) with an updated classification of the genus

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### Abstract

A study of *Sphaerophthalma* Blake from the southwestern USA has revealed a highly autapomorphic undescribed species. This species is described here as *S. tapio* Pitts & Sadler, **sp. nov.**, and is placed in a new species-group, the *S. tapio* species-group. This species seems to be found only at higher altitudes in southern Arizona. It is compared to other similar *Sphaerophthalma* species-groups and is likely most closely related to members of the *S. imperialis* species-group. An updated species-group classification of *Sphaerophthalma* is provided.

**Key words:** Sphaerophthalminae, solitary wasp, velvet ant, USA

### Introduction

Sphaerophthalminae is a diverse subfamily of Mutillidae that includes most of the nocturnal forms found in the New World. This subfamily can be distinguished from the other New World subfamily, Mutillinae, by having round eyes in both sexes.

Schuster (1958) published the only extensive revision of the Nearctic nocturnal male Sphaerophthalminae. Females mostly remain undescribed. Schuster (1958) described 122 species and subspecies, and created three new genera. For the genus *Sphaerophthalma* Blake 1871, he designated three new subgenera. Unfortunately, there are undeniable problems with Schuster's treatment of the nocturnal genera and species, and the validity of all of Schuster's subgenera is questionable. As such, Pitts *et al.* (2004) synonymized the subgenera of *Sphaerophthalma*, relying instead on species-groups, many of which were designated by Schuster (1958), for subgeneric classification. A more recent molecular phylogeny of the group (Pitts *et al.* 2010b) supports this species-group view.

Since Schuster's (1958) revision, several studies have treated taxonomy in *Sphaerophthalma*. Faunal studies of the Algodones Sand Dunes (Pitts *et al.* 2009), Deep Canyon (Pitts *et al.* 2010a), and the Nevada Test Site (Ferguson 1967) described new species of *Sphaerophthalma*. Pitts (2006) reviewed the *S. imperialis* species-group and Pitts *et al.* (2004) reviewed the *S. uro* species-group. Wilson *et al.* (2012) showed that *S. arota* is actually a group of four cryptic species. Lastly, biology and taxonomy have been addressed in members of the *S. jacala*, *S. pennsylvanica*, and *S. unicolor* species-groups (Pitts & Parker 2005; Pitts 2005; Wilson & Pitts 2009). Based on these recent publications, including Pitts *et al.* (2010b), and the results of this current study, an updated species-group classification for Nearctic *Sphaerophthalma* is given in Table 1.

While examining specimens of *Sphaerophthalma* from southern Arizona, three male specimens of an undescribed species belonging to an undescribed species-group were discovered. This species has distinct head, mandibular, metasomal, and genitalic morphology when compared to other species or species-groups. As such, we describe and illustrate this new species below.

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