



Article

urn:lsid:zoobank.org:pub:6126D769-A131-49DD-B07F-0386E62FF5B9

Unravelling cryptic species diversity in eastern Nearctic paper wasps, *Polistes* (*Fuscopolistes*), using male genitalia, morphometrics and DNA barcoding, with descriptions of two new species (Hymenoptera: Vespidae)

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Abstract

A study of male genitalia, morphometric head measurements and DNA barcoding revealed three overlooked species in eastern Nearctic *Polistes* (*Fuscopolistes*), two of which are described here: *P. (F.) hirsuticornis* Buck, **sp. nov.** and *P. (F.) parametricus* Buck, **sp. nov.** *Polistes carolina* of authors is a complex of two or three species. Type studies also uncovered new synonymies: *P. rubiginosus* Lepageletier, 1836, **sp. restit.** (= *P. perplexus* Cresson, 1872, **syn. nov.**; *P. generosus* Cresson, 1872, **syn. nov.**); *P. nigripennis* (De Geer, 1773) is removed from synonymy with *P. carolina* (Linnaeus, 1767) and tentatively synonymized with *P. canadensis* (Linnaeus, 1758) (= *Vespa nigripennis* De Geer, 1773, **syn. nov.**). A revised key to eastern Nearctic *Fuscopolistes* Richards, 1973 is presented. The male genitalia of eastern Nearctic species are illustrated in detail for the first time, and a preliminary genitalic key is presented. DNA barcoding revealed strongly divergent genetic lineages in three species besides "*P. carolina*". A so-called 'barcoding gap' was not detected, thereby ruling out species delimitation through divergence thresholds. Indirect evidence suggests that the newly described species may be obligate social parasites.

Key words: new synonymy, key, genitalia, morphometric study, discriminant function analysis, DNA barcoding, social parasitism