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Polistes dominula (Christ, 1791) (Hymenoptera: Vespidae: Polistinae) found in South Dakota, U.S.A.

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Polistes dominula (Christ, 1791) (Hymenoptera: Vespidae: Polistinae)
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Abstract. *Polistes dominula* (Christ, 1791) (Hymenoptera: Vespidae: Polistinae), a Palearctic paper wasp established in North America, is reported for the first time from the state of South Dakota, U.S.A.

Introduction

Polistes dominula (Christ, 1791) (Fig. 1) is a Palearctic paper wasp that was discovered in eastern North America near Boston, Massachusetts in the late 1970s (Hathaway 1981). This species has spread westward into various Canadian provinces and several states within the U.S. (see Cervo et al. 2000; Hoebeke and Wheeler 2005; Liebert et al. 2006; Buck et al. 2008 and references therein). The range of *P. dominula* has expanded westward to at least the Minneapolis-St. Paul metropolitan area in eastern Minnesota (Liebert et al. 2006). A second distinct front of *P. dominula* originated along the Pacific coast of North America (Landolt and Antonelli 1999; Borkent and Cannings 2004) and has extended into the western interior of the U.S. (Buck et al. 2008; Liebert et al. 2006). *Polistes dominula* has a proclivity for nesting in and around human shelters, and in cavities provided by items such as farm implements, machinery, trailers, and recreational equipment (Silagi et al. 2003). Thus, *P. dominula* is likely to follow patterns of human habitation and activity, and to continue to expand its range in North America (Cervo et al. 2000; Silagi et al. 2003). In this paper, I document the first record of the adventive Palearctic *P. dominula* nesting in South Dakota.

Material Examined

Specimens of *P. dominula* were collected from a single nest at a residence in Brookings, South Dakota. **New state record.** Brookings, Brookings County, South Dakota, 5-VII-2010, ex. nest in attic-window eave of residence, six adult females. Specimens were determined using keys and information in Buck et al. (2008), and they are deposited as voucher specimens at the USDA-ARS North Central Agricultural Research Laboratory, Brookings, South Dakota.

I observed other paper wasps in 2009 and 2010. In 2009, I observed five paper wasp nests with attendant workers and several foraging workers on flowering plants in Brookings, and all were native *Polistes fuscatus* (Fabricius, 1793) (Fig. 2), which has been the common paper wasp in the area. In July and August 2010, 25 nests with attendant females and one foraging female were found in the Brookings area, one foraging female in the town of Bruce (Brookings County), and three foraging females 8 km north of Bath (Brown County, northeastern South Dakota). Wasps collected at one of the nests constituted the state record for *P. dominula* above, and the remaining wasps observed at nests and foraging individuals were *P. fuscatus*.

Discussion

The geographic range expansion of *P. dominula* into South Dakota was expected, as it had been reported about 300 km away in eastern Minnesota within the last six years (Liebert et al. 2006). My observations suggest that *P. dominula* currently occurs at a low frequency in eastern South Dakota. However, other areas of the state need to be sampled to determine the extent to which *P. dominula* may be present.

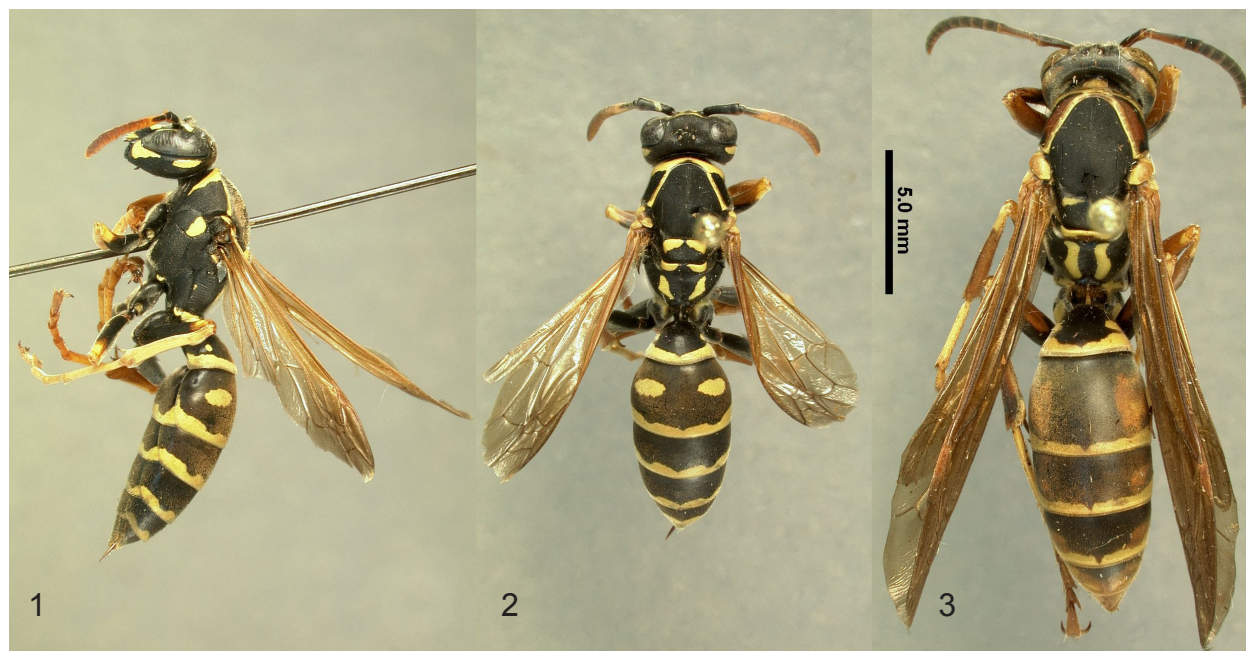


Figure 1-3. Habitus images. **1-2)** *Polistes dominula* (Christ) from France, lateral and dorsal. **2)** *Polistes fuscatus* (Fabricius) from Arkansas, U.S.A., dorsal.

South Dakota has a predominantly rural landscape consisting of agricultural fields and large tracts of grassland and forbs (Johnson and Larson 1999). *Polistes dominula* may be especially adapted to rural and suburban environments (Liebert et al. 2006). For instance, the habit of *P. dominula* to nest in cavities of items such as farm implements, machinery, trailers, and other transportable equipment may favor its spread in South Dakota and other rural states. However, *P. dominula* also has a proclivity for nesting in and around human shelters. The sparse human population in South Dakota provides a relatively limited number of anthropogenic shelters and may not facilitate rapid range expansion of *P. dominula*.

Invasive species often compete acutely with native congeneric species. The ecological niche of *P. dominula* overlaps with the native *P. fuscatus* in the use of food and nest sites, but the result of interactions between *P. dominula* and *P. fuscatus* in South Dakota is difficult to predict based on the outcomes elsewhere in North America. For instance, *P. dominula* has completely replaced *P. fuscatus* in areas of Michigan, U.S.A, but coexists with *P. fuscatus* in Ontario, Canada, although *P. dominula* has been in both locations for roughly equal amounts of time (Gamboa et al. 2002, Buck et al. 2008). *Polistes dominula* is generally favored over *P. fuscatus* by its broader prey spectrum (Cervo et al. 2000), greater proclivity for nectar storage (Silagi et al. 2003), faster development, higher productivity (Armstrong and Stamp 2003), and lower incidence of parasitism (Buck et al. 2008). However, winters can be severe in South Dakota, and this may favor overwintering survival of *P. fuscatus* (Gamboa et al. 2004). Additional studies are encouraged to determine the rate of expansion for *P. dominula* over the prevailing landscape and to determine its impact on native wasp fauna and prey species (Liebert et al. 2006).

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Literature Cited

- Armstrong, T. R., and N. E. Stamp. 2003.** Colony productivity and foundress behaviour of a native wasp versus an invasive social wasp. *Ecological Entomology* 28: 635–644.
- Borkent, C. J., and R. A. Cannings. 2004.** *Polistes dominulus* (Christ) (Hymenoptera: Vespidae: Polistinae) in British Columbia: first collection records of an invasive European paper wasp in Canada. *Journal of the Entomological Society of British Columbia* 101:149–150.
- Buck, M., S. A. Marshall, and D. K. B. Cheung. 2008.** Identification atlas of the Vespidae (Hymenoptera, Aculeata) of the northeastern Nearctic region. *Canadian Journal of Arthropod Identification* 5: 1-492.
- Cervo, R., F. Zacchi, and S. Turillazzi. 2000.** *Polistes dominulus* (Hymenoptera: Vespidae) invading North America: some hypotheses for its rapid spread. *Insectes Sociaux* 47: 155–157.
- Gamboa, G. J., E. I. Greig, and M. C. Thom. 2002.** The comparative biology of two sympatric paper wasps, the native *Polistes fuscatus* and the invasive *Polistes dominulus* (Hymenoptera, Vespidae). *Insectes Sociaux* 49: 45–49.
- Gamboa, G. J., M. A. Noble, M. C. Thom, J. L. Togonal, R. Srinivasan, and B. D. Murphy. 2004.** The comparative biology of two sympatric paper wasps in Michigan, the native *Polistes fuscatus* and the invasive *Polistes dominulus* (Hymenoptera, Vespidae). *Insectes Sociaux* 51: 153–157.
- Hathaway, M. A. 1981.** *Polistes gallicus* in Massachusetts (Hymenoptera: Vespidae). *Psyche* 88: 169–173.
- Hoebeke, E. R., and A. G. Wheeler. 2005.** First records of adventive Hymenoptera (Argidae, Megachilidae, Tenthredinidae, and Vespidae) from the Canadian Maritimes and the United States. *Entomological News* 116: 159–166.
- Johnson, J. R., and G. E. Larson. 1999.** Grassland plants of South Dakota and the northern Great Plains. South Dakota Agricultural Experiment Station, B566 (rev.): 1-288.
- Landolt, P. J., and A. L. Antonelli. 1999.** The paper wasp *Polistes dominulus* Christ (Hymenoptera: Vespidae) in the state of Washington. *Pan-Pacific Entomologist* 75: 58–59.
- Liebert, A. E., G. J. Gamboa, N. E. Stamp, T. R. Curtis, K. M. Monnet, S. Turillazzi, and P. T. Starks. 2006.** Genetics, behavior and ecology of a paper wasp invasion: *Polistes dominulus* in North America. *Annales Zoologici Fennici* 43: 595-624.
- Silagi, S. A., G. J. Gamboa, C. R., Klein, and M. A. Noble. 2003.** Behavioral differences between two recently sympatric paper wasps, the native *Polistes fuscatus* and the invasive *Polistes dominulus*. *Great Lakes Entomologist* 36: 99–104.

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