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NOTE

Adventive *Hylaeus* (*Spatulariella* Popov) in the New World (Hymenoptera: Apoidea: Colletidae)

The bee subgenus *Hylaeus* (*Spatulariella* Popov) includes about 18 species native to the Palearctic (Michener 2000). Six species are known from Europe (Dathe 1980), of which two have been recorded as adventive in the New World, *H. punctatus* (Brullé) and *H. hyalinatus* Smith. The first known collection of subgenus *Spatulariella* in the Western Hemisphere was of *H. punctatus* at Playa del Rey, Los Angeles County, southern California, in 1981 (Snelling 1983). Subsequently, *H. punctatus* has been found elsewhere in California (Ascher 2001) and in the city of Santiago in central Chile (Toro et al. 1989). A second species of *Spatulariella, H. hyalinatus,* has recently been recorded from the Fingerlakes Region of central New York State (Ascher 2001). The purpose of this note is to further document the establishment and spread of these two adventive bee species in the New World.

Information about the identification of the two adventive *Hylaeus* (*Spatulariella*), including illustrations and keys, can be found in Dathe (1980), Snelling (1983), Toro et al. (1989), and Ascher (2001). *Hylaeus hyalinatus* males can be recognized by the shape of the eighth sternum (S8); the distal spatulate process is connected to the base by an extremely narrow elongate stalk. In *Hylaeus punctatus* males, the distal spatulate process of S8 is broadly connected to the base. In addition, *H. punctatus* males have less extensive face markings; the supraclypeal area is usually black and lateral marks extend little, if at all, above the level of the epistomal sulcus.

Hylaeus hyalinatus.—The first report of this species in the New World was based on specimens collected during 1998-2000 on and near the campus of Cornell University in Ithaca, Tompkins County, New York (Ascher 2001). Subsequently, numerous *H. hyalinatus* were collected in Ithaca, elsewhere in Tompkins County such as along Route 34 in the Town of Newfield, and in New York City and adjacent Westchester County. Records of specimens collected by P. Gambino in New York City and deposited in his collection include: Bronx County: 1 ♀, Bronx High School of Science, 10 August 1997; 1 ♀, Van Cortlandt Park, Gunhill Road, 6 July 2000; New York County (Manhattan): 4 ♂, Hudson River at Rector/Liberty St., 29 July 1999; 1 ♀, Robert Wagner Park, 8 July 1999. Specimens collected in urban gardens in Manhattan and the Bronx by Kevin M. Cox include: Bronx Co.: 1 ♂, Bronx Bathgate Garden, 25 June 2004; 1 ♀, Fordham Bedford Lot-Busters Garden, 25 June 2004, yellow pan; 1 ♀, Krystal Garden, 25 June 2004; 1 ♂, Tremont Community Garden, 11 June 2005; New York Co.: 1 ♂, Harlem, Holy Rosary Garden, 27 May 2004. Additional specimens have been collected in Manhattan by J. S. Ascher in Central Park and Riverside Park (e.g., 1 ♂: 31 July 2002). Specimens collected during the Bronx River BioBlitz on 10 June 2005 by P. Gambino et al. are: Bronx County: 1 ♂, Drew Garden; 2 ♂, Vyse Avenue at 180th Street; 1 ♀, Prospect Avenue at 180th Street; Westchester County: 2 ♀, Bronx River at Cross County Parkway.

Hylaeus hyalinatus has not yet been found in Orange or Putnam counties in New York, or Fairfield County in Connecticut, which are all slightly to the north of Westchester County, despite intensive recent collecting in these areas. Records of flight in New York State now extend from May to October. The 1997 record from the

Bronx is the earliest known collection of *H. hyalinatus* in the New World.

Hylaeus punctatus.—The first records of this species from North America outside of California are of 15 ♀ and two ♂ specimens collected on the National Mall in the District of Columbia in 2004 by Sam Droege. One male was collected from flowers in the National Botanical Garden on 6 August; the other male was collected 3 August in the garden along the National Museum of Natural History along with 3 females. Another 12 females were collected in the Natural History Museum garden at an undetermined date in August of the same year. Both locations contained an unusual diversity of plant species with the original stock coming from throughout North America, but not Europe. Despite extensive surveys of gardens and natural communities elsewhere in the downtown sections of Washington and its suburbs, no other individuals of this species have been detected.

The first records of *H. punctatus* from Chile outside of the city of Santiago are of two series found in the American Museum of Natural History collection and determined by JSA. These series are from Region V in Petorca Province, north of Santiago, and from Region VI in Cachapoal Province, south of Santiago (in the Región Metropolitana: Santiago Province). The series from Petorca Province is of 2 ♀ and 2 ♂, collected at Cuesta El Melon in November 1998 by R. Madariaga. The series from Cachapoal Province is of 24 ♀ and 25 ♂ collected at Lago Rapel in January 2001 by Madariaga. New Records from Santiago are of 2 ♀ and 1 ♂ collected at Cerro San Cristóbal on 9 February 1994 by J. M. Carpenter and A. Davidson. These records demonstrate that *H. punctatus* is not restricted to urban areas in Chile. Specimens of *H. punctatus* from H. Toro's personal collection cited in Toro et al. (1989) are now in the collection of the American Museum of Natural History.

In both its native range and in the New World, *H. punctatus* is best known from Mediterranean-climate regions. However, records from central Europe (Dathe 1980) and the new record from Washington, D.C., suggest that this species has the potential to become established across much of temperate North and South America. Of the two adventive *Spatulariella* species, *H. hyalinatus* is the most likely to extend its range to the north, as this species is widely distributed in Europe north to Finland.

Discussion.—The disjunct distributions of *Hylaeus hyalinatus* and *Hylaeus punctatus* are consistent with human-assisted invasion processes, i.e., introduction and establishment at isolated foci, from which populations locally disperse and colonize. Many records of both *Spatulariella* are from gardens and/or near greenhouses where recently imported exotic plants are found. The potential role of botanical gardens, greenhouses, and nursery companies in spreading exotic bees both between and within countries should be assessed. Species of *Hylaeus* (*Spatulariella*) may be particularly prone to long distance transport as their nests are small and concealed within a variety of natural and artificial cavities (Ascher 2001).

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