Atha, D., D.P. Wijesinghe, and V. Lazzeri. 2018. First report of *Stellaria pallida* (Caryophyllaceae) for New York state. Phytoneuron 2018-64: 1–8. Published 11 September 2018. ISSN 2153 733X

FIRST REPORT OF *STELLARIA PALLIDA* (CARYOPHYLLACEAE) FOR NEW YORK STATE

DANIEL ATHA
Center for Conservation Strategy
New York Botanical Garden
Bronx, New York 10458
datha@nybg.org

D. P. WIJESINGHE
Department of Natural Sciences
LaGuardia Community College
31-10 Thomson Avenue
Long Island City, New York 11101
pwijesinghe@lagcc.cuny.edu

VALERIO LAZZERI
Museo di Storia Naturale del Mediterraneo
Via Roma 234, 57127 Livorno, Italy
valerio.lazzeri@gmail.com

ABSTRACT

Stellaria pallida is reported for New York State for the first time and is documented with herbarium specimens, DNA samples, and photographs. The species was first identified in 2017 in a photograph taken in Kings County (Brooklyn) in 2007 and uploaded to the citizen science website iNaturalist. *Stellaria pallida* may be confused with *S. media* — differences between the two species are discussed.

Stellaria pallida (Dumort.) Crépin is a European species which has spread as a weed to the Americas, Asia and Australia (Miller and West 2012). It is reported for North America only sporadically across the continent (USDA, NRCS 2018). It is not reported for New York State in the USDA PLANTS database (USDA, NCRS 2018) nor by Mitchell (1993) in the Caryophyllaceae of New York State or Morton (2005) in the Flora of North America. The species is not included in the recent checklist of New York State plants by David Werier (2017) and was not reported for the Flora of the New York Botanical Garden (Atha et al. 2016). It is not reported for the New England states (Haines et al. 2011). The species is reported for the flora of Pennsylvania (Rhoads & Block 2007) and as a watch species for the flora of Tennessee (Chester et al. 2015).

The validity of *Stellaria pallida* as a species distinct from the morphologically similar *S. media* (L.) Vill. is accepted throughout Europe (e.g., Chater & Heywood 1993; Morton 2005; Stace 2010), Australia (Miller & West 2012), and east-central Asia, the center of diversity for the genus (Mahdavi et al. 2012). Based on published descriptions and observations made by the third author on plants in Europe, *S. pallida* is usually distinguished by the smaller sepals, absence of petals, fewer stamens, and smaller, light brown seeds (see key below). In contrast to *S. media*, *S. pallida* is often characterized by a pale yellowish green color and the generally smaller size of its leaves. Rare examples of *S. pallida* with extremely reduced petals has been reported (Morton 2005). The reduction or absence of petals has been reported rarely also in *S. media* (Chater & Heywood 1993). Cleistogamy was considered diagnostic for *S. pallida* by Whitehead and Sinha (1967), but the character has been reported, if rarely, also in *S. media* (Allen 1988). Pedicel length for *S. pallida* is reported to vary from short and congested (Allen 1998) to wide spreading and up to four times the length of the sepals (Romo 1990).

In January 2017 the third author (VL) identified *Stellaria pallida* in a photograph taken by the second author (DPW) in Kings County (Brooklyn), New York, on 21 April 2007 and uploaded to the iNaturalist website (https://www.inaturalist.org) on 31 December 2016. Additional observations by the second author in 2017 and 2018, supported by photographs and descriptions, mainly in Kings County (Brooklyn), indicated that *S. pallida* was very common in urban habitats such as lawns and grassy areas beside streets where *S. media* often occurs. These observations were reported on iNaturalist and, where possible, confirmed or identified as *S. pallida* by the third author.

Based on photographs and descriptions provided by DPW and VL, the first author sought and found a large population of *Stellaria pallida* in the Bronx, New York, from which herbarium specimens and DNA samples were prepared in early May 2018. Subsequently, all 89 specimens filed as *S. media* from New York state at the New York Botanical Garden (NY) and the Brooklyn Botanic Garden herbaria (BKL, currently at NY) were examined. No New York state specimens were found that were previously identified as *S. pallida*. The herbarium search yielded 8 specimens from New York state consistent with the characters described for *S. pallida*. The first New York state specimen was collected in 1990 at West Point Military Reservation, Orange Co., New York. No specimens of *S. neglecta* were found from New York state. The European *S. holostea* L. was collected once in Brooklyn, New York (Kings County) in 1872 (*Merriam s.n.*, BKL). The species is probably a historical waif in New York state.

In New York City, plants of *Stellaria pallida* are prostrate or decumbent annuals (Fig. 1, 2) and usually occur in lawns, roadsides, sidewalk cracks, tree pits, and similar, highly disturbed, eutrophic and sunny sites. It is sometimes found growing with *S. media*.

Voucher specimens. USA. New York. Bronx Co.: New York City, grounds of the New York Botanical Garden, W of the Bronx River and N of Stone Mill road, SW of the Museum/Library building, 40.867072, -73.87977 (WGS84, ±10m), ca 15 m elev., 4 May 2018, *Atha 16000* (MICH, NY); NW corner of Garden, ca 267 m W (by air) of the Bronx River and 113 m S (by air) of Kazimiroff Blvd., on bridge between Twin Lakes, 40.867854, -73.876288 (WGS84, ±5 m), 5 Apr 2009, *Atha 6923* (NY). Kings Co.: East 16th St, N of Ave I to LIRR cut, 30 ft elev., 28 Mar 2011, *Bennett 11006* (BKL); Gateway National Recreation Area, Floyd Bennett Field, near Hanger B, 14 May 1992, *Clemants & Wallick 4588* (BKL). Orange Co.: West Point Military Reservation, cliffs between N. & S. Dock, 24 Apr 1990, *Clemants & Barringer 3358* (BKL). New York Co.: Manhattan, Central Park, the Mount, between 103rd and 104th Streets and between 5th and 6th Avenues, 40.793469, -73.954082 (WGS84, ±25m), ca 24 m elev., 27 Apr 2015, *Atha & Seirup 14999* (NY); Central Park, N perimeter wall, between 109th and 110th Streets and between 7th and 8th Avenues, 40.799838, -73.956650 (WGS84, ±25m), ca 13 m elev, 3 May 2014, *Atha & Alvarez 14365* (NY). Queens Co.: Alley Pond Park, 17 Apr 2008, *Greller 080417-24* (BKL).

Key to *Stellaria* species of New York City

1. Plants annual from slender taproots; leaves ovate or elliptic, at least the lowermost petiolate; hairs on stem internodes usually forming a distinct line; seeds distinctly tuberculate.
   2. Sepals 3–4 mm long; petals usually absent, rarely to 0.5 mm long; stamens 1–3; seeds usually tan, 0.6–0.8 mm diam . ..... **Stellaria pallida**
   2. Sepals 4–5 mm long; petals present, usually 2–3 mm long; stamens 3–5; seeds usually brown, 0.8–1.5 mm diam ..... **Stellaria media**
1. Plants perennial from rhizomes; leaves linear or lanceolate, all sessile; hairs on stem internodes usually not forming a line; seeds rugose or indistinctly tuberculate.
   3. Flowers in axillary cymes ..... **Stellaria alsine**
   3. Flowers in terminal cymes.
      4. Leaves widest below the middle; sepals linear-lanceolate, ≥ 3x as long as wide; petals shorter than the sepals . ..... **Stellaria graminea**
      4. Leaves widest above the middle; sepals ovate-lanceolate, ≤ 3x as long as wide; petals about as long as the sepals ..... **Stellaria longifolia**

In their study of seed morphology, Mahdavi et al (2012) found that mode for seed size and color were distinct (dark brown and 1.16 × 1.06 mm; brown and 0.81 × 0.73 mm for *Stellaria media* and *Stellaria pallida*, respectively). Although we did not find seed color to be consistent, seed size of New York City plants are consistent with data reported by Mahdavi (Fig. 5). The strongest characters for identification of *S. pallida* are the absent or rudimentary petals and the small seeds. On the basis of sterile characters alone, it is possible that stressed or senescent specimens of *S. media* may be misidentified as *S. pallida* and, conversely, specimens of *S. pallida* growing in ideal conditions with abundant nutrients, sunlight and moisture may appear larger than normal and show a bright green color similar to *S. media*. Based on the observation made in New York City, *S. pallida* tend to occur in brightly lit, drier sites than *S. media*.

Figure 1. *Stellaria pallida* in a lawn, the habitat where it most often occurs in New York City. Note the distinctive yellow-green color (*Atha 1600*, NY).

Figure 2. *Stellaria pallida*, whole plant showing prostrate, mat-forming habit and consistently small leaves (Wijesinghe, iNaturalist observation <https://www.inaturalist.org/observations/11841934>).

Figure 3. *Stellaria pallida*, apical portion of stem (*Atha 16000*, NY). Bar is one centimeter.

Figure 4. *Stellaria pallida*. Open flower showing absence of petals and reduced number of stamens (Wijesinghe, iNaturalist observation <https://www.inaturalist.org/observations/11841934>).

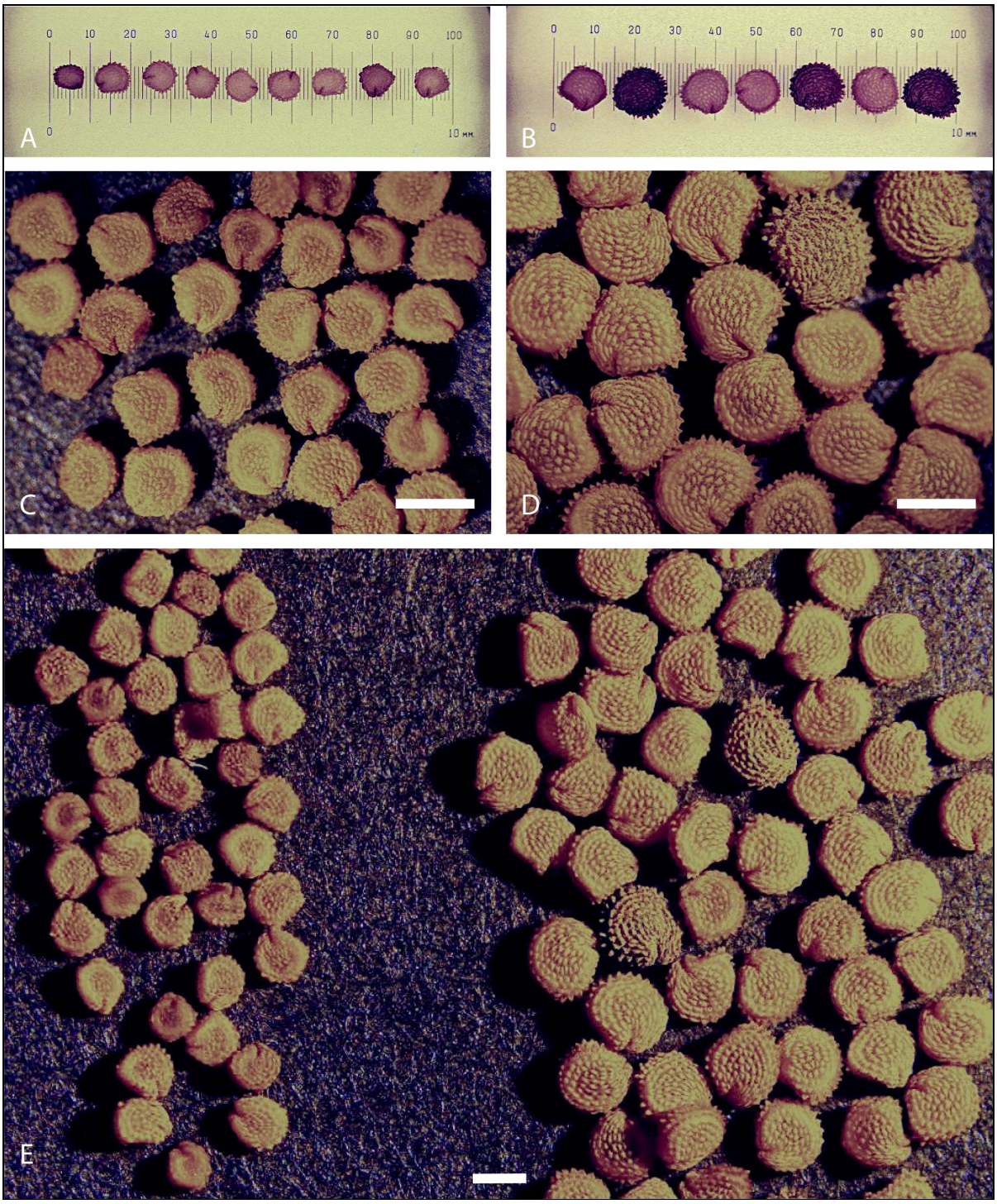

Figure 5. *Stellaria media* and *Stellaria pallida* seeds. *Stellaria pallida* (A, C and E (left)); *Stellaria media* (B, D, E (right)). Scale bar for A and B is 10 mm total, smallest tick marks are 0.1 mm. Scale bar for C,D and E is 1 mm.

This discovery, made on the basis of photographs posted on iNaturalist, demonstrates the importance of web-based citizen science initiatives as places where fruitful collaboration between botanists and others can take place and biological information may be exchanged in an efficient and productive manner.

ACKNOWLEDGEMENTS

We are grateful to Meryl Rubin for processing the herbarium specimens. We thank the Central Park Conservancy for their collaboration on the Central Park Flora Project, the New York City Department of Parks and Recreation for their collaboration and permission to collect specimens of invasive species on city park land, and Guy Nesom for helpful suggestions on the manuscript.

LITERATURE CITED

Allen, D.E. 1988. *Stellaria*. In T.C.G. Rich and A.C. Jermy (eds.). Plant Crib 1998. Botanical Society of the British Isles, London. <http://bsbi.org/identification> Accessed May 2018.

Atha, D., T. Forest, R.F.C. Naczi, M.C. Pace, M. Rubin, J. Schuler, and M.H. Nee. 2016. The historic and extant spontaneous vascular flora of the New York Botanical Garden. Brittonia 68: 245–277.

Chater, A.O. and V.H. Heywood. 1993. *Stellaria* L. Pp. 161–164, in T.G.. Tutin, N.A. Burges, A.O. Chater, J.R. Edmondson, D.M. Moore, D.H. Valentine, S.M. Walters, and D.A. Webb. Flora Europaea (ed. 2), Vol. 1. Cambridge Univ. Press, Cambridge.

Chester, E.W., B.E. Wofford, J. Shaw, D. Estes, and D.H. Webb. 2015. Guide to the Vascular Plants of Tennessee. Univ. of Tennessee Press, Knoxville.

Haines, A., E. Farnsworth and G. Morrison. 2011. New England Wild Flower Society's Flora Novae Angliae: a manual for the identification of native and naturalized higher vascular plants of New England. Yale Univ. Press, New Haven, Connecticut.

Mahdavi, M., M. Assadi, F. Fallahian, and T. Nejadsattari. 2012. The systematic significance of seed micro-morphology in *Stellaria* L. (Caryophyllaceae) and its closest relatives in Iran. Iranian J. Bot. 18: 302–310.

Miller, C.H. and J.G. West. 2012. A revision of the genus *Stellaria* (Caryophyllaceae) in Australia. J. Adelaide Bot. Gard. 25: 27–54.

Mitchell, R.S. 1993. Portulacaceae through Caryophyllaceae of New York State. Contributions to a Flora of New York State XI. Bull. No. 486, New York State Museum. Univ. of the State of New York, Albany.

Morton, J.K. 2005. *Stellaria* L. Pp. 96–114, in Flora of North America North of Mexico, Vol. 5. Oxford Univ. Press, New York and Oxford.

Rhoads, A.F. and T.A. Block. 2007. The Plants of Pennsylvania, An Illustrated Manual (ed. 2). Univ. of Pennsylvania Press, Philadelphia.

Romo, A-M. 1990. *Stellaria* L. Pp. 253–260, in Castroviejo, S., Laínz M., López G., Monteserrat P., Muñoz Garmendia F., Paiva J. and L. Villar (eds.). Flora Ibérica. Vol. II: Platanaceae-Plumbaginaceae (partim). Real Jardín Botánico, C.S.I.C. Madrid.

Stace, C.A. 2010. New Flora of the British Isles. 3rd ed. Cambridge Univ. Press, Cambridge.

USDA, NRCS. 2018. The PLANTS Database. National Plant Data Team, Greensboro, North Carolina. <http://plants.usda.gov> Accessed 13 May 2018.

Werier, D. 2017. Catalogue of the vascular plants of New York State. Mem. Torrey Bot. Soc. 27: 1–542.

Whitehead, F.H. and R.P. Sinha. 1967. Taxonomy and taximetrics of *Stellaria media* (L.) Vill., *S. neglecta* Weihe and *S. pallida* (Dumort.) Piré. New Phytol. 66: 769–784.