B A N I S T E R I A

A JOURNAL DEVOTED TO THE NATURAL HISTORY OF VIRGINIA

ISSN 1066-0712

Published by the Virginia Natural History Society

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Banisteria 61: N1–6

SHORTER CONTRIBUTIONS

UNUSUAL COLLECTION OF *JANUSIUS SYLVESTRIS* (BANKS, 1899) (COLLEMBOLA: SYMPHYPLEONA: SMINTHURIDAE [S. STR.])

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Editor: J. C. Means | Received 8 May 2026 | Accepted 24 June 2026 | Published 25 June 2026

https://virginianaturalhistorysociety.com/2026/01/14/number-61-2026/

Citation: Staines, C. L. 2026. Unusual collection of *Janusius sylvestris* (Banks, 1899) (Collembola: Symphypleona: Sminthuridae [s. str.]). Banisteria 61: N1–6.

ABSTRACT

A Townes style Malaise trap was deployed in a *Pinus taeda* L., 1753 (Pinaceae) plantation at the Smithsonian Environmental Research Center, Edgewater, Maryland. Large numbers of *Janusius sylvestris* (Banks, 1899) (Collembola: Symphypleona: Sminthuridae [s. str.]) were collected from 14 March to 11 April 2026.

Keywords: Malaise trap, Maryland, non-target arthropods, springtails.

INTRODUCTION

Collembola are often the most abundant arthropod in many terrestrial ecosystems (Hopkin, 1997). They are considered omnivores, but many species are fungivores or detritivores (Filser, 2002). Collembola are critical to litter decomposition and nutrient recycling (Filser, 2002).

Sminthuridae s. str. (Collembola: Symphypleona), commonly called globular springtails, occur in surface litter layers, on vegetation, and in tropical forest canopies. They are usually collected using Berlese funnels or pitfall traps, or by sweeping through grass with a pan (Coleman et al., 2017). It is one of the springtail families that includes species occurring in freshwater habitats (Thorp & O'Neill, 2015).

Sminthuridae (s. str.) are globular in shape, short, plump, with a furcula to enable jumping. The antennae with four antennomeres, the basal antennomere is short and antennomeres two to four increasing in length, and the apical antennomere with whorls of setae. The abdomen has the first four segments fused (Capinera, 2001). There are about 240 species known worldwide placed in 30 genera (Bellinger et al., 1996-2024).

Members of the family Sminthuridae feed on pollen grains, spores, and soft plant material above ground. Generally, Collembola tend to form aggregations, especially in relatively uniform habitats (Christiansen, 1964). Aggregation pheromones have been identified for some soil and leaf litter Collembola (Verhoff et al., 1977). Two species of Sminthuridae are economic pests: *Bourletiella hortensis* (Fitch, 1863) in North America and *Sminthurus viridis* (L., 1758) a native of Europe which has been introduced into the Americas, Australia, New Zealand, and South Africa (Richards, 1968).

Janusius sylvestris (Banks, 1899) was described as *Smynthurus sylvestris* from dead leaves in woods from Sea Cliff, Long Island, New York. Banks (1903) described *Smynthurus facialis* from under dead leaves in the District of Columbia collected in January. Christiansen & Bellinger (1998) synonymized *S. facialis* with *S. sylvestris*. Bretfeld (2002) synonymized *S. variegatus* Axelson, 1903 from Siberia with *S. sylvestris*. Bretfeld (2010) erected the genus *Janusius* with *Smynthurus sylvestris* as the type species.

The species in North America has been reported from Connecticut, District of Columbia, Indiana, Michigan, Minnesota, New York, North Carolina, Pennsylvania, and Quebec, Canada (Christiansen & Bellinger, 1998). BugGuide (2026) has records from Colorado, Delaware, Kentucky, Maryland, Massachusetts, New Mexico, and Vermont. iNaturalist (2026) contains research grade records from Iowa, Missouri, New Hampshire, New Jersey, Ohio, and Virginia. The species is Holarctic being known from Siberia (Bretfeld, 2010).

According to the Maryland Biodiversity Project (MBP, 2026) the species is widely distributed in Maryland. It has been reported in eight of Maryland's 23 counties (Fig. 1). Specimens were collected or observed from 29 March to 1 June, with most collected in April.

There is little published information on the biology of *J. sylvestris*. Other than Banks' (1899, 1903) reports from leaf litter, only three papers mention biological data. Maynard (1951) reported specimens from sweeping low-growing shrubs at the edge of woods in June and taken in *Sphagnum* (Sphagenaceae) in July. Pielou & Verma (1968) captured a single adult emerging from sporophores of *Fomitopsis betulinus* (Bull.) BK Cui, NL Han, & YC Dai, 2016 (Formitopsidaceae) and Matthewman & Pielou (1971) captured two adults emerging from sporophores of *Fomes fomentarius* (L.) Fr., 1849 (Polyporaceae) in eastern Canada. All reports classify the species as *S. facialis*. BugGuide (2026) has a record from Charlemont, Massachusetts collected sweeping *Tsuga canadensis* (L.) Carrière, 1855 (Pinaceae) on 22 May 2010 and one from Brimfield State Forest, Hamden County, Massachusetts on leaves of *Maianthemum canadense* Desf., 1807 (Asparagaceae) on 4 May 2010.

MATERIALS AND METHODS

This project is an outgrowth of the Coleoptera inventory at the Smithsonian Environmental Research Center (SERC), located in Anne Arundel County, Maryland (see Staines, 2025 and references therein). For a detailed description of SERC habitats see Staines & Staines (2020).

A Townes style Malaise trap was deployed in a *Pinus taeda* L, 1753 plantation along Dock Road (38.535105°, -76.324361°) at SERC on 7 March 2026. The site has a mature stand of *P. taeda* with nearly complete canopy. The understory consists of saplings of *Liquidambar styraciflua* L., 1753 (Altingiaceae), *Acer negundo* L., 1753 (Sapindaceae), and *Fagus grandifolia* Ehrh., 1788 (Fagaceae). Ground level is mostly clear but with occasional *Rosa multiflora* Thunb., 1784 (Rosaceae), *Celastrus orbiculatus* Willd., 1819 (Celastraceae), *Toxicodendron radicans* (L.)

Kuntze, 1891 (Anacardiaceae), *Lonicera japonica* Thunb., 1784 (Caprifoliaceae), and *Parthenocissus quinquefolia* (L.) Planch., 1887 (Vitaceae).

The trap was checked weekly, the catch was transferred to 70% ethanol and taken to the laboratory for identification. Identifications were made using Christiansen & Bellinger (1998) and Bellinger et al. (1996-2024). Voucher specimens are deposited in the Towson University Insect Collection.

Figure 1. Distribution of *Janusius sylvestris* in Maryland (from MBP, 2026)

RESULTS

On 14 March 2026, the collection bottle contained 642 *Janusius sylvestris* which was 97% of the weekly catch. High numbers continued with the 21 March collection (423, 90% of catch). Numbers decreased on 4 April (136, 42% of catch), 11 April (3, 1.4%). No specimens were captured after 11 April.

DISCUSSION

Malaise traps are usually thought of as effective means of capturing flying insects, especially Diptera and Hymenoptera (Skvarla et al., 2021 and references therein). Capture of Collembola in Malaise traps is not unusual (Matthews & Matthews, 1970, Skvarla et al., 2021). There are published papers reporting high numbers of Collembolans in Malaise traps (Matthews & Matthews, 1970 (New York); Haenni & Matthey, 1984 (Switzerland); Cepeda-Pizzarro et al., 2013 (Chile); Greenslade & Florentine, 2013 (Tasmania); Pernin & Langlois, 2013 (France); Palacios-Vargas et al., 2022 (Mexico).

Greenslade & Florentine (2013) captured 2458 Collembola representing eight families in six Malaise traps over seven months in Tasmania. Palacios-Vargas et al. (2022) provided the number of specimens collected for each genus at three locations in Tlaxcala, Mexico using three Malaise traps in each location for a total of 15 and 17 months of collections. Four genera of Sminthuridae were collected with a total of 678 specimens (Palacios-Vargas et al., 2022). This contrasts with 1204 specimens of a single species collected in a three-week period at SERC.

Malaise trap results are influenced by topography, density of vegetation, relation to prevailing wind, temperature, precipitation, and location of trap in sun versus shade (Gressitt & Gressitt, 1962). Also, the time of year may affect the taxa collected and their abundance (Palacios-Vargas et al., 2022).

While ubiquitous in leaf litter, many researchers do not identify Collembola due to their small size, the color polymorphism in numerous species, and unfamiliarity with available resources. Dukes et al. (2022) unsuccessfully attempted to identify Collembola using DNA due to poor representation in databases and high intraspecific variability. Currently, the most useful Collembolan identification aid is Bellinger et al. (1996-2024).

This is the first report of the species being collected in numbers. None of the reports in online resources mention abundance.

Janusius sylvestris appears to be a spring species. Records in Maryland range from 29 March to 1 June, most are in April (MBP, 2026, iNaturalist, 2026, BugGuide, 2026). Specimens observed further north and west emerge later (April to June, most are in May).

There are two outliers mentioned in BugGuide (2026) - Colorado, San Miguel County, Big Gypsum Valley near Slickrock, Colorado and Utah Border, 23 September 2012 and New Mexico, Socorro County, Bosque del Apache, 6 December 2021. iNaturalist (2026) reports the species from Iowa, Black Hawk County, 1 October 2025. This is too little data to attempt to draw any conclusions.

The biology of *J. sylvestris* is largely unknown. Most of the collection notes do not indicate forest type. The sweeping from *T. canadensis* record (BugGuide, 2026) and the results of this study in a *P. taeda* plantation, may indicate a preference for coniferous forests.

ACKNOWLEDGEMENTS

I thank Alison Cawood and Rachael Mady (SERC, Citizen Science) for sponsorship, purchasing supplies, and administrative support. Thanks to Jim Brighton, Maryland Biodiversity Project, for the use of the Maryland *Janusius sylvestris* distribution map. Susan L. Staines provided field and editorial assistance. Michael S. Caterino, Plant and Environmental Sciences Department, Clemson University, and an anonymous reviewer provided helpful comments on an earlier draft of this manuscript.

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