

***Simulium vittatum*, Cytospecies IS-7, Larvae**

Catalog No. NR-53891

For research use only. Not for use in humans.

Contributor and Manufacturer:

Darold P. Batzer, Professor, and Elmer W. Gray, Assistant Project Director, Black Fly Research and Resources Center (BFR2), Department of Entomology, The University of Georgia, Athens, Georgia, USA

Product Description:

Classification: Simuliidae, *Simulium*

Species: *Simulium vittatum* sensu stricto (common name: black fly)

Cytospecies: IS-7

Original Source: *Simulium vittatum* (*S. vittatum*), cytospecies IS-7 was collected from Flaxmill Brook in Cambridge, New York by C. A. Tarrant in September 1981.¹

Comments: This species is a competent vector (biological and mechanical) of vesicular stomatitis New Jersey virus (VSNJV).²

S. vittatum complex is distributed across North America. This species complex consists of two species: *S. tribulatum* (also known as cytospecies IILL-1), found throughout the continent, and *S. vittatum* sensu stricto (also known as cytospecies IS-7), found primarily in the northern and western United States and Canada.³ *S. vittatum* is the vector for VSNJV, the causative agent of vesicular stomatitis in ungulates such as cows, horses and swine. Vesicular stomatitis is characterized by fever and vesicles in the oral cavity and on the muzzle, snout, lips and coronary bands of feet, teats and prepuce.² *S. vittatum* also transmits the parasitic nematode *Onchocerca* under laboratory conditions.⁴

Material Provided:

NR-53891 contains instar larvae provided on moistened paper towels in sealed Petri dishes. The product is shipped on blue ice to keep the larvae cool during shipping. Note: Live *S. vittatum* can also be obtained in egg (NR-53890), pupal (NR-53892) or adult stages (NR-53893).

Packaging/Storage:

NR-53891 is prepared and shipped by the University of Georgia [Black Fly Research and Resource Center](#). Upon arrival, larvae should be immediately placed in a larval rearing apparatus such as bubblers, stir-bar and beaker, gyratory shaker or a flowing water system.

Growth Conditions:

Standard *S. vittatum* rearing procedures are recommended.^{5,6} See Appendix I for details on handling *S. vittatum* larvae.

Citation:

Acknowledgment for publications should read "The *Simulium vittatum* cytospecies used in this work were produced with the support of NIH Task Order C-08, Contract No. HHSN2722017000351, Task Order No. 75N93020F00002 and obtained through BEI Resources, NIAID, NIH: *Simulium vittatum*, Cytospecies IS-7, Larvae, NR-53891."

Biosafety Level: 1

Appropriate safety procedures should always be used with this material. Laboratory safety is discussed in the following publication: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health. [Biosafety in Microbiological and Biomedical Laboratories](#). 6th ed. Washington, DC: U.S. Government Printing Office, 2020; see www.cdc.gov/biosafety/publications/bmb15/index.htm.

Disclaimers:

You are authorized to use this product for research use only. It is not intended for human use.

Use of this product is subject to the terms and conditions of the BEI Resources Material Transfer Agreement (MTA). The MTA is available on our Web site at www.beiresources.org.

While BEI Resources uses reasonable efforts to include accurate and up-to-date information on this product sheet, neither ATCC® nor the U.S. Government makes any warranties or representations as to its accuracy. Citations from scientific literature and patents are provided for informational purposes only. Neither ATCC® nor the U.S. Government warrants that such information has been confirmed to be accurate.

This product is sent with the condition that you are responsible for its safe storage, handling, use and disposal. ATCC® and the U.S. Government are not liable for any damages or injuries arising from receipt and/or use of this product. While reasonable effort is made to ensure authenticity and reliability of materials on deposit, the U.S. Government, ATCC®, their suppliers and contributors to BEI Resources are not liable for damages arising from the misidentification or misrepresentation of products.

Use Restrictions:

This material is distributed for internal research, non-commercial purposes only. This material, its product or its derivatives may not be distributed to third parties. Except as performed under a U.S. Government contract, individuals contemplating commercial use of the material, its products or its derivatives must contact the contributor to determine if a license is required. U.S. Government contractors may need a license before first commercial sale.

References:

1. Brockhouse, C. L. and P. H. Adler. "Cytogenetics of Laboratory Colonies of *Simulium vittatum* Cytospecies

- IS-7 (Diptera: Simuliidae)." J. Med. Entomol. 39 (2002): 293-297. PubMed: 11931029.
- Reis, J. L., Jr., et al. "Lesion Development and Replication Kinetics During Early Infection in Cattle Inoculated with Vesicular Stomatitis New Jersey Virus via Scarification and Black Fly (*Simulium vittatum*) Bite." Vet. Pathol. 48 (2011): 547-557. PubMed: 20858740.
 - Adler, P. H., D. C. Currie and D. M. Wood. The Blackflies (Simuliidae) of North America. (2004) New York, New York: ROM Publication in Sciences.
 - Lehmann, T., M. S. Cupp and E. W. Cupp. "Analysis of Migration Success of *Onchocerca lienalis* Microfilariae in the Haemocoel of *Simulium vittatum*." J. Helminthol. 69 (1995): 47-52. PubMed: 7622790.
 - Gray, E. W. and R. Noblet. "Black Fly Rearing and Use in Laboratory Information: Bioassays." Rearing Animal and Plant Pathogen Vectors. (2014) Maramorosch K. and F. Mahmood (Eds.) Boca Raton: CRC Press.
 - Bernardo, M. J., E. W. Cupp and A. E. Kiszewski. "Rearing Black Flies (Diptera: Simuliidae) in the Laboratory: Colonization and Life Table Statistics for *Simulium vittatum*." Ann. Entomol. Soc. Am. 79 (1986): 610-621.
- ATCC® is a trademark of the American Type Culture Collection.



Appendix I: Handling *Simulium vittatum* Larvae

Shipping:

- Larvae are shipped overnight on paper towels moistened with deionized water in sealed Petri dishes.
- Petri dishes containing the larvae are shipped in a Styrofoam cooler with blue ice to keep the larvae cool during shipping.

Procedure Upon Arrival:

- Upon arrival, open the shipping package and immediately remove the Petri dish and carefully unseal.
- Place the larvae in a 20°C to 22°C larval habitat.
- The receiving laboratory will need some type of larval rearing apparatus such as bubblers, stir-bar and beaker, gyratory shaker or a flowing water system. It is recommended to use a flowing water system for rearing black flies through a complete life cycle.

Food Preparation:

Required Materials

- Lab Diet® 5322 Certified Rabbit Diet (16% crude minimum protein)
- Soybean Meal (47% crude minimum protein)
- 100 cm³ beaker
- 14.7 L stainless steel bucket, 28 cm in diameter (Bucket should be calibrated and marked with a graduated cylinder and a permanent marker)
- Standard household blender (blades replaced every 60 days)
- USA standard testing sieve, no. 270, 53 micron opening
- Sieve support square (20 × 20 cm, constructed of 3.5 × 1.5 cm wood)
- Sealed storage container (minimum of 2000 cm³)
- Garden hose with nozzle that produces an even spray cone

Preparing Dry Food

- Combine 100 cm³ of dry rabbit chow and 100 cm³ of dry soybean meal in household blender, blend for 30 seconds or until material is uniformly ground.
- Store blended food material in sealed storage container.

Preparing Food Slurry

- Place sieve support square into bucket, it should fit tight and support the sieve above the 7 L line.
- Place sieve onto the sieve support square and add 100 cm³ of food mixture gently into the sieve.
- Turn water on at the faucet and release pressure via the spray nozzle into the sink; water pressure should be minimal.
- Quickly move spray from sink onto the food material in the sieve.
- Spray water into the sieve gently using enough water pressure to aggressively float and mix/move the food material, but not so much that the food material is splashed out of the sieve.
- Constantly move the spray nozzle while washing the food material so that there is constant movement of the food material on the surface of the sieve.
- Stop spraying when the 7 L line is reached.
- Remove the sieve and discard of the remaining food material in the sieve. The food slurry is the material in the bucket.