

***Simulium vittatum*, Pupae**

Catalog No. NR-53892

For research use only. Not for use in humans.

Contributor and Manufacturer:

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Product Description:

Classification: *Simuliidae*, *Simulium*

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

Original Source: *Simulium vittatum* (*S. vittatum*) was collected from Flaxmill Brook in Cambridge, New York, USA, 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 and contains two species: *S. tribulatum* (also known as cytospecies IILL-1), found throughout the continent, and *S. vittatum* sensu stricto, 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-53892 contains pupae provided on moistened paper towels in sealed Petri dishes. The product is shipped on blue ice to keep the pupae cool during shipping.

Note: Live *S. vittatum* can also be obtained in egg (NR-53890), larval (NR-53891) or adult stages (NR-53893).

Packaging/Storage:

NR-53892 is prepared and shipped by the University of Georgia [Black Fly Research and Resource Center](#). Upon arrival, remove Petri dishes and ensure dishes are right up and pupae are on a moist paper towel. Pupae should be maintained at 19°C to 21°C with adult emergence occurring within 3 to 4 days. Pupae may be stored in refrigeration (4°C to 8°C) for a short period, but viability will decrease if stored for an extended duration.

Growth Conditions:

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

Citation:

Acknowledgment for publications should read “The *Simulium vittatum* 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*, Pupae, NR-53892.”

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 (BMBL). Current Edition. Washington, DC: U.S. Government Printing Office.

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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.

2. 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.
3. 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.
4. 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.
5. 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.
6. 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.

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APPENDIX I: HANDLING *Simulium vittatum* PUPAE

Shipping:

1. Pupae are shipped overnight on paper towels moistened with deionized water in sealed Petri dishes.
2. Petri dishes containing the pupae are shipped in a Styrofoam cooler with blue ice to keep the eggs cool during shipping.

Procedure Upon Arrival:

1. Upon arrival, open the shipping package and immediately remove the Petri dish. Ensure that the Petri dish is right side up.
2. Carefully remove the parafilm seal and remove the lid. Confirm that paper towel beneath the pupae is moist. The pupae must remain moist at all times.
3. Pupae should be maintained at 19°C to 21°C with adult emergence occurring within 3 to 4 days.
4. Emerging adults can be carefully removed from the Petri dish via aspirator or the emerging flies can be enclosed in a small insect cage.