

MALARIA RESEARCH & REFERENCE REAGENT RESOURCE CENTER

Anopheles gambiae Patton (Cellia)

Strain Name: G3, MRA-112

Place of Origin: McCarthy Island, the Gambia

Colonization date: 1975 Established by: Unknown

Deposited by: Dr. William Collins

Genotype: 2La/+, 2r+/+, TEP1 s/s

Phenotype: red stripe, polymorphic for c+ (collarless)

Karyotype: undefined

Ribosomal DNA form: Savanna (predominantly)

Insecticide Resistance: none

Larval Morphological Traits



Collarless (c+) is caused by a uric acid build-up in the larvae. Expression is often variable but best seen in L4 larvae. G3 is polymorphic for this trait.



Red stripe-if present, individuals expressing red stripe are female



When reared in a dark pan, larvae with wildtype eye color will melanize when compared to a cohort reared in a white pan.

Adult Morphological Traits











Morphological characteristics of An. gambiae s.l. adults.

Authentication Methods used to confirm stock identity

- 1. Examined immatures for the collarless (c+) trait: L4 larvae are polymorphic for c+
- 2. Examined the color of the larvae when cultured in a black pan: larvae are distinctly melanized when compared to a cohort reared in a white pan.
- 3. Treated 50 larvae at 0.4ppm DDT for 24 hours to confirm susceptible status.
- 4. Performed molecular An. gambiae identification; all An. gambiae s.s. and majority savanna rDNA form.
- 5. Performed molecular combined 2La and TEP1 authentication: polymorphic for 2La and s/s for the TEP1 allele.
- Examined adults microscopically for morphological characters: all individuals had standard features of An. gambiae and wild eye color.



MALARIA RESEARCH & REFERENCE REAGENT RESOURCE CENTER

7. A cohort of females was fed on a *Plasmodium cynomolgi* B infected monkey: Individuals had both encapsulated and unencapsulated oocysts in the midgut. (not performed as often as other authentications).

References referring to this stock:

Benedict, M. Q., L. M. McNitt, et al. (2003). "Genetic Traits of the Mosquito *Anopheles gambiae*: Red Stripe, frizzled, and homochromy1." The Journal of Heredity 94(3): 227-235.

Benedict, M. Q. and C. S. Rafferty (2002). "Unassisted Isolated-pair Mating of *Anopheles gambiae* (Diptera: Culicidae) Mosquitoes." Journal of Medical Entomology 39(6): 942-944.

Benton, R., K. S. Vannice, et al. (2007). "An essential role for a CD36-related receptor in pheromone detection in Drosophila." Nature 450(7167): 289-293.

DeJong, R. J., L. M. Miller, et al. (2007). "Reactive oxygen species detoxification by catalase is a major determinant of fecundity in the mosquito *Anopheles gambiae*." PNAS 104(7): 2121-2126.

Jones, W. D., P. Cayirlioglu, et al. (2006). "Two chemosensory receptors together mediate carbon dioxide detection in Drosophila." Nature 445(7123): 86-90.

Jones, W. D., T. A. Nguyen, et al. (2005). "Functional conservation of an insect odorant receptor gene across 250 million years of evolution." Current Biology 15(4): R119-21.

Levine, R. S., A.T. Peterson, and M.Q. Benedict. (2004). "Distribution of members of *Anopheles quadrimaculatus* say s.l. (Diptera: Culicidae) and implications for their roles in malaria transmission in the United States." Journal of Medical Entomology. 41(4): 607-613.

Lobo, N. F., J. R. Clayton, et al. (2006). "High efficiency germ-line transformation of mosquitoes." Nature Protocols 1(3): 1312-1317.

Meleshkevitch, E. A., P. Assis-Nascimento, et al. (2006). "Molecular characterization of the first aromatic nutrient transporter from the sodium neurotransmitter symporter family." The Journal of Experimental Biology 209(16): 3183-3198.

Okech, B. A., D. Y. Boudko, et al. (2008). "Cationic pathway of pH regulation in larvae of *Anopheles gambiae*." J Exp Biol 211(6): 957-968.

Paskewitz, S. M. and L. Shi (2005). "Bypassing the midgut results in development of Plasmodium berghei oocysts in a refractory strain of *Anopheles gambiae* (Diptera: Culicidae)." The Journal of Medical Entomology 42(4): 712-5.

Rheault, M. R., B. A. Okech, et al. (2007). "Molecular cloning, phylogeny and localization of AgNHA1: the first Na+/H+ antiporter (NHA) from a metazoan, *Anopheles gambiae*." J Exp Biol. 210(21): 3848-3861.

Smith, K. E., L. A. VanEkeris, et al. (2007). "Cloning and characterization of AgCA9, a novel {alpha}-carbonic anhydrase from *Anopheles gambiae* Giles sensu stricto (Diptera: Culicidae) larvae." J Exp Biol. 210(22): 3919-3930.

Wilkins, E., P. Howell, et al. (2007). "X and Y chromosome inheritance and mixtures of rDNA intergenic spacer regions in *Anopheles gambiae*." Insect Molecular Biology 16(6): 735-741.

Wilkins, E. E., S. C. Smith, et al. (2007). "Rubidium marking of Anopheles mosquitoes detectable by field-capable X-ray spectrometry." Med Vet Entomol 21(2): 196-203.

Yoder, J. H. and S. B. Carroll (2006). "The evolution of abdominal reduction and the recent origin of distinct Abdominal-B transcript classes in Diptera." Evolution & Development 8(3): 241-251.

Related Sequences:

TEP1 gene susceptible – Pubmed Accession Number XM_315150