

Double Infection in a Mosquito *Armigeres subalbatus* (Coquillett) (*A. obturbans* auct.) with Two Different Species of Filaria

To complete their life cycle, the filarial worms have to undergo a period of development in an appropriate arthropod host. The site of development in the host, however, varies with the different species of the parasite. It is generally believed that there are 3 main sites which the parasite may select for its development – these are the thoracic muscles, the malpighian tubules and the fat body (LAVOPIERRE¹).

We have been recently working on a filaria species found in slow loris, *Nycticebus coucang*, which develops exclusively in the fat body of certain mosquito species (ZAMAN and CHELLAPPAH^{2,3}). This species of filaria has been assigned to the genus *Breinlia* by DUNN and RAMACHANDRAN⁴ and is identical to *Breinlia sergenti* described by PETTER⁵.

The mosquito that we have employed mostly in our experimental studies is *Armigeres subalbatus* from a colony maintained in our laboratory (BARR and CHELLAPPAH⁶). This species of mosquito is also an excellent vector of *Brugia pahangi* (EDESON, WHARTON and

LAING⁷). We were, therefore, interested in finding out whether or not this mosquito will allow simultaneous development of both filarioids, *Breinlia sergenti* and *Brugia pahangi*. The double infection in the mosquito, if it occurred, could be easily traced because the development of *Brugia pahangi* is exclusively in the musculature while *Breinlia sergenti*, exclusively in the fat body. In addition, it is also possible to clearly differentiate the infective larvae of both the filarioids.

The mode of infecting the mosquitoes were as follows: A batch of 5- to 6-day-old mosquitoes were fed on a naturally infected slow loris with a microfilaraemia rate of 750 mf/20 cm³. The slow loris was anaesthetized by i.p. injection of sodium barbitol and then introduced into a cage containing the mosquitoes. The feeding took place almost immediately, after which, the mosquitoes were removed to a separate cage and were maintained on honey and water. They were then allowed to oviposit, which generally occurred on the 4th day. They were now ready for the second blood meal. A cat experimentally infected with *Brugia pahangi* in our laboratory and having a microfilaraemia rate of 230 mf/20 cm³ was used for this purpose. This animal was anaesthetized, as in the case of slow loris, and introduced into the mosquito cage. The mosquitoes which took the second blood meal were separated and kept on honey and water for another 4 days. On the 4th day after the second blood meal, a few mosquitoes were fixed in formaline saline. These were then embedded in paraffin and/or celloidin for section cutting. The remaining mosquitoes were maintained for a further period till both species of the filarioids reached maturity and were then dissected for recovering the infective larvae.

The results showed that both *Breinlia sergenti* and *Brugia pahangi* can develop in the same mosquito host simultaneously. Figures 1 and 2 show a section of a mosquito with double infection. The thoracic muscles contain the developing larvae of *Brugia pahangi* and the aggregate of fat cells near the thorax contain *Breinlia sergenti*. The dissections made at a later date, from the same batch of mosquitoes showed that the larvae of both the species of the filarioids would also develop to maturity.

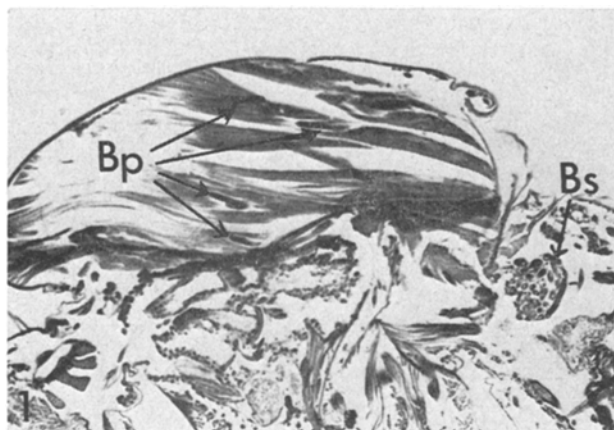


Fig. 1. Section of a mosquito infected with *Brugia pahangi* and *Breinlia sergenti*. Dark elongated structures in the thoracic muscles (B.p) are the developing larvae of *Brugia pahangi*. Developing larvae of *Breinlia sergenti* (B.s) are lying in a clump of fat cells near the thorax.

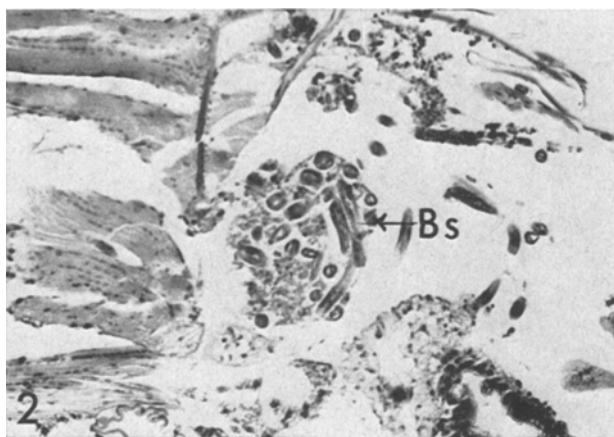


Fig. 2. Same section showing an enlargement of *Breinlia sergenti* (B.s) larvae lying in the fat cells.

Résumé. Étude de l'infection simultanée du moustique *Armigeres subalbatus* par deux espèces de filaires, *Brugia pahangi* et *Breinlia sergenti*. Les stades de développement de ces filaires peuvent être facilement différenciés du fait que le *B. pahangi* se tient exclusivement dans la musculature thoracique et le *B. sergenti* dans le tissu adipeux.

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¹ M. M. J. LAVOPIERRE, Ann. trop. Med. Parasit. 52, 326 (1958).

² V. ZAMAN and W. T. CHELLAPPAH, Acta trop., in press.

³ V. ZAMAN and W. T. CHELLAPPAH, submitted to J. med. Entomol.

⁴ F. L. DUNN and C. P. RAMACHANDRAN, Proc. 1st UNESCO Reg. Symp. trop. Parasit., Singapore 1962, p. 252.

⁵ A. J. PETTER, Bull. Soc. zool. Fr. 83, 423 (1958).

⁶ A. R. BARR and W. T. CHELLAPPAH, Bull. wed Heth Org. 31, 439 (1964).

⁷ J. F. B. EDESON, R. H. WHARTON and A. B. G. LAING, Trans. R. Soc. trop. Med. Hyg. 54, 439 (1960).