

The continued introduction of intermediate host snails of *Schistosoma mansoni* into Hong Kong

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Abstract

The South American planorbid snail Biomphalaria straminea, an intermediate host of Schistosoma mansoni, was first introduced into Hong Kong with tropical aquarium plants or fish around 1970. Genetic data indicate that a second introduction occurred in 1981-82.

The first introduction of *Biomphalaria straminea* to Hong Kong was reported in 1974 (1). Since then, this snail has increased in numbers and spread throughout the New Territories, and has also colonized southern China (2, 3). In 1982, we studied the electrophoretically detectable genetic variation in 19 enzymes in snail population samples from throughout the area, and mapped the distribution of individual alleles at five polymorphic loci. The geographic distribution of one allele, coupled with the known history of the snail colonies, indicated that this potential disease vector is still being introduced into Asia.

The evidence for multiple introductions stems from observed variation at a gene coding for leucyl-alanine peptidase (*Pep-2*).^a Three alleles segregate the Hong Kong populations sampled, and one of these, *Pep-2*^{0.92}, was restricted to a single population from Pak Shek Au near the border with China. At Pak

Shek Au, the snails inhabit outdoor concrete ponds used for rearing tropical aquarium fish. When this site was first visited in 1981, *B. straminea* was not present (4). The colony is therefore very recent and could have arisen either by range expansion from source populations a few kilometres to the south, or from a separate introduction.

Biomphalaria straminea was first found in Hong Kong in 1973 in the Lam Tsuen valley, 8 km south-east of Pak Shek Au. Its dispersal into adjacent areas during the late 1970s has been reported (5). The genetic patterns indicated that populations found 10 km west and 15 km east of Lam Tsuen could have been derived from the original population by dispersal and range expansion. In contrast, the Pak Shek Au colony, with its unique *Pep-2* allele, is genetically distinct from the Lam Tsuen stock. The frequency of the *Pep-2*^{0.92} allele in the Pak Shek Au colony was 0.26 (in 128 snails) in 1982. This marker gene could not have reached this frequency in the time available if it had arisen by mutation in a snail of the Lam Tsuen stock, and thus we believe that the Pak Shek Au colony was derived from a separate founder stock.

We are unfortunately unable to comment on the geographical origin(s) of the Lam Tsuen and Pak Shek Au snails. *Biomphalaria straminea* occurs in Brazil, Guyana, Martinique, and Venezuela, but its genetic variability in its natural range has yet to be investigated.

There is every reason to expect further introductions of this snail into Asia and its secondary spread to other parts of the world.^b Indeed, it is surprising that its more widely distributed relative, *Biomphalaria glabrata*, has not yet been detected in Asia.

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^a An enzyme number has not yet been assigned to this peptidase.

^b WALKER, J. *The finding of Biomphalaria straminea amongst fish imported into Australia*. Unpublished WHO document, WHO/Schisto/78.46, 1978.

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RÉSUMÉ

L'INTRODUCTION DE MOLLUSQUES HÔTES INTERMÉDIAIRES DE *SCHISTOSOMA MANSONI*
SE POURSUIT À HONG KONG

Le planorbidé sud-américain *Biomphalaria straminea*, hôte intermédiaire de *Schistosoma mansoni*, a été introduit pour la première fois à Hong Kong avec des plantes ou des poissons d'aquarium tropicaux aux environs de 1970. En 1982, on a effectué des analyses électrophorétiques en vue de déceler une variation génétique sur 19 enzymes dans des

échantillons de populations de mollusques prélevés dans toute la région. La variation au niveau d'un gène codant pour la leucylalanine-peptidase donne à penser qu'une colonie au moins de ces mollusques provient d'une souche-mère différente de la colonie initiale, attestant ainsi plusieurs introductions du mollusque dans cette région.

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