

---

# Hunting and Trapping to Control Bait Shy Rats

CHUNG GAIT FEE

No 39, Jalan USJ 5/1F, 47610 Subang Jaya, Selangor Darul Ehsan, Malaysia

*The detection of bait shy biotype of Rattus tiomanicus and Sundamys muelleri was reported in a few oil palm estates in Malaysia and Indonesia. Conventional rat baiting is ineffective to control bait shy rats. Estate managers have resorted to biological control (augmentation of barn owl), and more recently by shooting, hunting and trapping bait shy rats. These measures including biological (augmentation of barn owl) and chemical (applying conventional wax baits) controls used by hard pressed planters cannot obtain effective control of bait shy rats. Moreover, shooting, hunting and trapping have not been evaluated in any reduction in rat population in the field or any significant reduction in crop damage. However, the planters are certainly relieved in seeing so many rats being removed and killed. In this paper, the incidences of bait shy rat biotypes, stop gap control measures and several research approaches are briefly discussed aiming to create greater awareness.*

**Keywords:** Bait shy rats, Rattus tiomanicus, Sundamys muelleri, shooting, hunting, trapping.

In May 2019, there was a forum in Miri entitled *Rodent Control Sharing Session*. The main purpose was to share information on rodent pests in oil palm in East Malaysia and rat baiting using a brand of brodifacoum wax bait. Ironically, besides several rat species well controlled by conventional wax baits in Miri areas, a bait shy rat species known as *Sundamys muelleri* is present here in an oil palm estate. The common names of *S. muelleri* are Swamp Giant rat, Muller's rat, Muller's Sundamys, Muller's Giant Sunda rat; and the Malay names are Tikus ayer and Tikus lembah. Most conventional wax baits available were tested and none was found to be attractive to *S. muelleri*. Consequently, the male and female inflorescence (unopened and opened), developing fruit bunches, unripe and ripe fruits (including chewing through the hard shell to feed on the kernel), and post anthesis male inflorescence (PAMI), are all observed to be badly damaged. Most of all, *S. muelleri* loves to feed on oil palm fruits (especially the young developing fruits) including those collected loose

fruits and fruits attached to harvested fresh fruit bunches on the roadside platform awaiting collection. It was reported that the consumption amounted to 10.80 g ripe fruit per rat per day (Hoong & Hoh, 1992). One cannot help but feel very angry because *S. muelleri*, beside feeding on oil palm fruits, also causes much wastage by leaving large pieces of mesocarp chips and debris behind. If the wastage is taken into account, the crop loss on ripe fruit per rat per day could be much higher. This data is yet to be available.

*S. muelleri* is reported to be common in lowland forest near swampy areas, forest edge and lightly wooded areas or bottom of valleys. It has also been trapped in Gombak forest, near Kuala Lumpur. This terrestrial rat feeds on plant and animal matters. In Sarawak, the reported habitats are peat swamp forests and limestone caves. It is a pest of oil palm reported in Malaysia (mainly in Sabah, and Sarawak (Sampadi near Kuching and Miri) and in Indonesia (Belitung Island, Bangka Island). This largely terrestrial rat with distinctive pads

on the soles of the hind feet has adapted to climb up to palms and taking on arboreal habits by moving along the horizontal fronds. Coincidentally, the albino form of *S. muelleri* has been found in these oil palm plantings. What causes *S. muelleri* to change to feeding on oil palm is unknown.

For management of small rodents in oil palm (mainly several species of small to medium-sized rats), various methods are involved; namely ecological control (habitat management to discourage population; maintaining habitats for natural predators), cultural control/agronomic measures (weed control and ground cover management to discourage population; regular and complete harvesting, efficient loose fruit collection and good pruning standards), physical control (use equipment to trap them; proofing or protecting against rat infestation), biological control (introduction of cats; use dogs in hunting; augmentation of barn owl population) and chemical control (mainly applying rodenticides in baits). In the integrated pest management (IPM) of rats in oil palm, the most widely practiced components are chemical control (apply rat baits) and biological control (augmentation of barn owl population). For many years, successful rat control relied on effective rat baiting. Towards the turn of the century, some success in rat control was attributed to the success in augmentation of barn owl population by introduction of nest boxes. At the same time, there are also reports both in the failure in establishment of a sufficient barn owl population and failure in rat control after successful establishment of barn owl population. Biological control of rat using barn owl is widely recommended but there are recent reports on its failure to achieve effective rat control in oil palm plantations (Chung, unpublished, 2017; Balasubramaniam & Chung, 2018).

## BAIT SHY RATS INCIDENCES

To date, there are few reported cases of *S. muelleri* as pests of oil palm in Malaysia and Indonesia. The reported incidences are:

- Case no 1: *S. muelleri* in its old name *Rattus muelleri* was reported in 1992 as serious pest of oil palm in Klias, Beaufort, Sabah (Hoong & Hoh, 1992). There was no mention about bait shyness or any failure in control using rat baits.
- Case no 2: *S. muelleri* was the main rat species in oil palm in Sampadi, Kuching, Sarawak (Rizuan & Noor Hisham, 2015). It was successfully controlled using in-house product (bromadiolone wax baits).
- Case no 3: *S. muelleri* was reported to be bait shy to local wax baits in oil palm in Belitung Island, Indonesia (Chew, pers. comm., 2014). Shooting is being carried out at night to reduce rat population and damage.
- Case no 4: *S. muelleri* was reported to be bait shy to local wax baits in oil palm in Bangka Island, Indonesia (Chung, 2015). Shooting is being carried out at night to reduce rat population and damage.
- Case no 5 : *S. muelleri* was reported to be bait shy to local wax baits in oil palm in Miri, Sarawak, Malaysia (Chung, 2016). Intensive trapping using wire netting cages is being carried out to reduce rat population and thus damage.

## CONTROL OF BAIT SHY WOOD RAT (*RATTUS TIOMANICUS*) - HUNTING

*R. tiomanicus* (Figure 1) was reported to be bait shy to local wax baits in an oil palm estate



Figure 1 Bait shy *R. tiomanicus* – see the characteristic white belly

in East Coast, Johore, Malaysia (Chung unpublished, 2010; 2017). Barn owl population has been encouraged by setting up nest boxes over the last 9 years at the intensity of one unit per 4 ha oil palm planting. Occupancy rate (indicative of owl abundance) remains moderate and damage to fruit bunches on palms are still high. Recently, the manager has initiated dog assisted rat hunting (Figure 2). This is an innovative measure from the hard pressed planters who are unable to achieve effective results from both the biological (augmentation of barn owl) and chemical (applying conventional wax baits) controls.

#### **CONTROL OF BAIT SHY SWAMP GIANT RAT (*SUNDAMYS MUELLERI*) - TRAPPING**

*S. muelleri* was reported to be bait shy to local wax baits in oil palm in Miri, Sarawak, Malaysia. Barn owl is not present in the natural

ecosystem and biological control by introduction of nest boxes is not feasible now. Various rat baits tested were not taken or poorly taken up. At present, an innovative measure from the hard pressed planter is intensive mass trapping of rats using wire netting cages (Figures 3 & 4).

The effectiveness of dog assisted rat hunting and intensive mass trapping have not been evaluated in assessing any reduction in rat population in the field or any significant reduction in crop damage. The planters are certainly relieved in seeing so many rats being removed and killed. It could be similar to the case of “shooting” to control bait shy *S. muelleri* (Chung 2015). After many rounds of shooting a year ago (2014), several blocks previously with extensive rat damage now have reduced damage. A total of 350 000 rats were killed in 2014 in the oil palm plantation. However, “hunting” carried out (March 2015) in one of these oil palm blocks recovered 69



Figure 2 Dog assisted rat hunting - see dogs awaiting the escape of rats when the worker lifts up the piles of fronds with the help of a long aluminium pole (photo is by courtesy of Victor Yu Yong Hao)



Figure 3 Rat cage placed near frond pile to trap *S. muelleri* using ripe oil palm fruit as lure



Figure 4 Rat cage with bait shy *S. muelleri* successfully trapped

rats (small juvenile rats to medium-sized rats) from 50 palm plot. The rat number is estimated to be 139 rats per hectare (assuming the stand of oil palm is 140 palm/ha). This indicates continuing rat breeding after the cessation of shooting.

### RESEARCH APPROACHES

Areas of research to be considered include:

- i) ecological control - habitat management: will a clean weeded bare ground plus removal of cut fronds be disadvantages to bait shy rat population?
- ii) cultural control/ agronomic measures - weed control and ground cover management: will a uniformly short grass lawn be disadvantages to bait shy rat population?
- iii) physical control –
  - a) proofing or protecting with metal shield: cutting off frond butts and smoothening basal stem to place a 1 m band metal plate collar to prevent bait shy rats climbing?
  - b) removal by traps: large pitfall traps?
- iv) biological control – predators, parasites and diseases: for example encouraging monitor lizard (*Varanus salvator*) population (Lim, 1999)?
- v) chemical control - applying chemical agents:
  - a) applying rodenticides in liquid baits?
  - b) testing new bait formulation?
  - c) spraying repellent to inflorescence and fruit bunches?
  - d) applying rodenticide dust to burrows?
- vi) combination of two or more of above control?

Research must be carried out in small scale test first and moving into larger plot efficacy trial for promising control/combination of controls.

## GENERAL

My salute to both the managers in their endeavour, while awaiting for the discovery/finding of an effective control measure for controlling bait shy *R. tiomanicus* and *S. muelleri*. Bait shy rats may not be the important pests of oil palm nationwide. It is a real pain for the managers facing these menaces which are destroying the crop and harbouring numerous external and internal parasites and indirectly contributing to larger population of poisonous snakes (potential increase in snake bites to workers and estate personnel).

Bait shy rats will incur higher crop losses due to less effective control measures. Moreover, these measures are most likely to be more intensive and more costly due to higher usage of labour. In short, the oil palm plantation will suffer from lower crop yield and higher expenditure to deal with such problem rats.

Beside the bait shyness problems in rat control in the oil palm, there are a constant pressure from outsiders to discontinue the use of rodenticides. Once implemented, the currently used anticoagulant rodenticides

....., will not be allowed to be used in oil palm plantations. The oil palm planters will have to use other measures to control rats, (quite similar to control bait shy rats).

## REFERENCE

- BALASUBRAMANIAM, R. and CHUNG, G.F. 2018. A study of rat species, their populations and crop damage in mature oil palm plantations in Central Kalimantan. *The Planter* **94** (1106): 277-289.
- CHEW, P.S. 2014. Personal communication.
- CHUNG, G.F. 2010. *Estate Visit Report*. Unpublished. 11 pages.+ 3 Appendices (4 pages).
- CHUNG, G.F. 2015. The control of swamp giant rat [*Sundamys muelleri* (Jentink), Muridae, Rodentia] infestation by shooting. *The Planter* **91** (1068): 157-168.
- CHUNG, G.F. 2016. Preliminary investigations on the infestation of swamp giant rat, *Sundamys muelleri* (Jentink), Muridae, Rodentia, in an oil palm estate, Miri, Sarawak. *The Planter* **92** (1079): 65-79.
- CHUNG, G.F. 2017. *Estate Visit Report*. Unpublished. 8 pages.
- C.M. RIZUAN, Z.A. and NOOR HISHAM, H. 2015. Composition and Distribution of Small Rodents in FGV's Oil Palm Regions in Sabah and Sarawak. Poster presentation in PIPOC, 6-8 October, 2015. KLCC, Kuala Lumpur.
- HOONG, H. W. and HOH, C. K. Y. 1992, Major pests of oil palm and their occurrence in Sabah. *The Planter* **68** (793): 193-210.
- LIM, B. L. 1999. Reptiles as potential biocontrol agents of pest rodents in plantation areas. In: *Proc. Symposium on Biological Control in the Tropics*. (Loke Wai Hong; Soetikno S Sastroutomo; Ivon G Counter; Jambali Ali; Lum Keng Yeang; Vijayasegaran S and Yong Hoi Sen, eds.). 82-8.