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# Myxomatosis: the occurrence of *Spilopsyllus cuniculi* (Dale) larvae on dead rabbit kittens

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## SUMMARY

*Spilopsyllus cuniculi* larvae were found actively feeding on dead rabbit kittens left in nest boxes for up to 12 days.

## INTRODUCTION

European rabbit fleas (*Spilopsyllus cuniculi* (Dale)) have been bred on domestic rabbits for approximately 4 years at the Keith Turnbull Research Institute. The method used is similar to that of Sobey, Menzies & Conolly (1974). The life cycle of the flea is bound to that of its host the rabbit (*Oryctolagus cuniculus* (L.)) (Mead-Briggs & Vaughan, 1969; Rothschild & Ford, 1969, 1973), and the presence of some viable nestlings for at least 5 days after littering is essential for the breeding of the flea (Rothschild & Ford, 1973). As large numbers of fleas were needed for research purposes as well as for placing in the field, fleas were bred throughout the year.

## METHODS

The method used to breed fleas was similar to that described by Sobey *et al.* (1974) and Sobey, Conolly & Menzies (1977).

Fleas were placed on a pregnant rabbit approximately 12 days *ante partum* and the doe allowed to litter undisturbed. Approximately 1 day *post partum* the doe and kittens were examined and all dead kittens removed. The doe and remaining kittens were removed from the nest box at day 12 *post partum*. 'Old' fleas were combed from them and they were then returned to the animal house, where the kittens were weaned. Any dead kittens were removed from the nest material, which was retained in the flea house. Fleas were allowed to emerge from the nest material and were collected on 'sweep' rabbits (Sobey *et al.* 1977).

## RESULTS AND DISCUSSION

When dead kittens were removed from the nest material 12 days *post partum* it was found that those kittens which had been dead for some days (up to 11 days), and had begun to putrefy, frequently carried flea larvae. These larvae were obviously feeding on the decaying tissues of the dead kittens. The larvae were

Table 1. *The number of fleas emerged from nests in which larvae have fed on dead kittens and from nests with no dead kittens. Does littered the same day are compared*

| | Kittens littered | Weaned | Dead kittens | First peak emergence | Second peak emergence | Total emergence |
|---|---|---|---|---|---|---|
| 4 | May 1976 | 3 | 1, larvae present | 814 | 18* | 832 |
| 3 | May 1976 | 3 | — | 1345 | 941 | 2286 |
| 7 | May 1976 | 7 | — | 1805 | 131* | 1936 |
| 4 | June 1976 | 1 | 3, larvae present | 45 | 800 | 845 |
| 9 | June 1976 | 9 | — | 2797 | 318 | 3115 |
| 6 | August 1976 | 5 | 1, larvae present | 1751 | 2704 | 4455 |
| 7 | August 1976 | 7 | — | 1644 | 2086 | 3730 |
| 7 | August 1976 | 6 | 1, larvae present | 3724 | 1062 | 4786 |

* Nest held for 86 days before second peak fleas allowed to emerge.

quite healthy and appeared to be further developed than those larvae feeding on the dried blood faeces of the adult flea which is the normal diet of the flea larvae. Kittens which died 6–12 days *post partum* were not as frequently attacked as the putrefying longer dead kittens. European rabbit flea larvae are obviously scavenger feeders, and even carnivorous if the situation arises. Rothschild (1975) has also noted that larvae can feed on the tissues of baby rabbits which have recently died.

The presence of flea larvae living on their hosts as ectoparasites is not an uncommon occurrence. The larvae of *Hoplopsyllus* can live as ectoparasites in the fur of the arctic hare while the larvae of *Tunga* and *Dasypsyllus* are occasionally facultative ectoparasites on the body of the host (Rothschild, 1966).

As dead kittens usually result in poor flea reproduction through lack of flea mating, some nests in which flea larvae feed on dead kittens will produce some fleas provided mating occurred before the litter died. If only one dead kitten is found per litter and it carries flea larvae it would appear that there is little or no detrimental effect on flea yield (Table 1). Results from these nests are as varied as nests in which no kittens die (R.C.H. Shepherd, unpublished data).

The results (Table 1) show the variation within flea emergence, also that the presence of flea larvae on the dead kittens within the nest may act as an added food source and therefore be of some value in increasing the yield of fleas. Nests that are stored for a long period before allowing second peak fleas to emerge usually have poor second peak emergence and therefore result in a low yield overall. The other low yielding nest produced 845 adult fleas but only one kitten was weaned. Most of the kittens from that nest were killed 2–3 days *post partum*, possibly before all mating and egg laying had been completed. The yield from that nest for one kitten is therefore not comparatively low.

It therefore appears that the occasional stillborn kitten or those kittens killed soon after birth should be left in the nest material until separation as they act as an alternative food source for the larvae, and the addition of extra dried blood to these nests may not be necessary. However, it is necessary to know when and how many kittens died. If the majority of kittens die at or soon after birth mating and

egg laying will be poor. The presence of a pheromone-like factor from kittens is necessary to stimulate mating. The mortality of only one or two kittens per litter, if the litter is large, will not have much effect on mating and egg laying. If the kittens are killed 3–4 days *post partum* there has been sufficient time for mating to occur and the dead kittens act as an added food source and favour larval survival.

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