

My life as a cat flea, *Ctenocephalides felis*.

It feels like a lifetime waiting within my silken cocoon hidden in the cat's bed, I'm a pre-emerged adult cat flea and I've been thinking about how I got here.

My parents and generations of relatives lived on the old cat, its bed near the Aga. Our only function is to reproduce, and this activity requires regular blood feeds from a permanent host. After an orgy of multiple mating, my egg was laid along with about 24 others that day; like many parasites fleas produce lots of eggs as losses of juveniles are expected. My pearly-white oval egg, about 0.5mm long fell from the sleeping cat onto the bedding, an old woollen jumper. Beneath the cat was perfect, warm and dark. Hatching was easy using my 'egg tooth' to pierce the shell and wriggle out, I was a two mm long bristly, apod larva. Being negatively phototactic and positively geotactic I quickly burrowed beneath the woollen jumper and entered the understorey; a world that was warm, humid and dark, everything I could wish for. The floor was layers of old yellowing musty newspaper, covered with a tangled jungle of organic debris, cat hair, dried cat food, soil and faecal particles. Above me fragments of dried flea faeces (flea dirt) were trickling through the canopy, adult fleas consume an awful lot of blood daily and the faecal overflow of blood ensures that we are provided for. The blood particles were voraciously consumed along with a few nearby flea eggs (we do have cannibalistic tendencies), the ingested haem turned me brown.

I was not alone, herds of plump *Acarus siro* mites were nibbling food particles and the fungal fruiting bodies that grew on the cellulose of the newspaper. *Dermatophagoides* and *Glycyphagus* dust mites were recycling squames and fragments of moulted larval and nymphal 'skins'. Close by, predatory *Cheyletus eruditus* mites had ambushed a few *Acarus* mites, piercing them with their chelicerae and sucking out their body fluids; their deflated dry bodies drifted about, gradually disintegrating. The all-blood diet enabled me to quickly develop through two larval stages in 10 days, becoming a third stage larva about 5 mm long. In the debris were egg capsules of the cestode *Dipylidium caninum*, fleas are an intermediate host of this tapeworm, so I might as well consume an egg and be one of the 2% that contains the cystercercoid as an adult.

By the late third stage it was becoming more urgent to form a protective cocoon as unfortunately other larvae had shown increased cannibalistic tendencies, and also by coincidence the faecal blood supply had dried up. I found an undisturbed space within a matrix of fibres that enabled me to assume a more upright position, with the silk from my salivary glands I spun a loose and sticky cocoon that was soon camouflaged with dirt and debris. Other larvae that pupated 'naked' had desiccated or were cannibalised. Within the cocoon I underwent metamorphosis forming an exarate pupa and finally after the pupal-imaginal moult remained within the cocoon as a quiescent pre-emergent adult.

So that's my story so far and I'm still waiting. Recently the old cat had 'the one way trip' to the vets and was gone; the basket was moved to the shed and it's so much colder here than in the nice warm kitchen. The average survival of pre-emerged adults is only a few months in present conditions, so it's not looking good for me. But at least delaying emergence until an adequate host stimuli should improve my chances of a successful host attack.

Without warning I sensed a nearby warm body and the concurrent repeated pressure on the cocoon stimulated my rapid emergence, and I ascended through the woollen canopy. Using my antennae, simple eyes and sensillum I detected CO₂ gas, air currents and passing shadows that enabled me to orientate myself towards the source; at last a potential host. My powerful legs have a specialised energy storage mechanism and its sudden release allowed me to 'jump with style' towards the source; a visiting spaniel puppy who fortunately had taken great interest in sniffing and pawing the old cat's bed. The bristles on my legs enabled me to snag the pup's hair and I quickly moved towards

the warm and dark skin surface; this was the place my streamlined, smooth and shiny body was made for. I weaved effortlessly between the hair shafts instinctively finding the thin abdominal skin. Now it was time to feed piercing the skin with my maxilla, engorging took five glorious minutes. But something was wrong, my muscles went into a tetanic spasm and I became paralysed, the puppy had been treated with a systemic insecticide. My first feed was to be my last.