Time Spent by *Calliphora Spp*. Blowflies on Standard Traps Baited with Liver and Ammonia

Florica Morariu[1], Sorin Morariu[2], Benoni Lixandru[1], Smaranda Mâsu[1], Anca Pricop[1]

[1] *Faculty of Animal Sciences and Biotechnologies, 300645– Timisoara, Calea Aradului 119, Romania*
[2] *Faculty of Veterinary Medicine, 300645– Timisoara, Calea Aradului 119, Romania*

Abstract
The larvae of blowflies from the *Calliphoridae* family cause fly strikes in sheep and other species of economic importance. Impaired wool, decrease of ewe fertility, and even death can occur in heavy infestations. This paper describes the *Calliphora spp*. blowflies' behavior on and around a trap baited with liver and ammonia before they entered in. More than half of *Calliphora spp*. blowflies (50.88%) stayed a medium time (eight to fourteen seconds) on the standard trap, while only 1.79% of them spent a longer time (26 to 30 seconds) before entering the trap.

Keywords: behavior, *Calliphora spp*., traps.

1. Introduction

Fly strike is not only a perennial problem for sheep farmers all over the world [1; 2], but also causes a lot of production and welfare concerns [3].
The main genera causing myiasis belongs to *Calliphoridae* family, mainly *Lucilia* (*L. sericata, L. cuprina*) and *Calliphora* (*C. vicina, C. vomitoria*). On the other hand, these flies are important in forensic science, insect evidence being most commonly used to estimate the time of death of a corpse (the postmortem interval, PMI).
In the last years, the control of populations of pest insect species using non-return traps and targets, usually accompanied by semiochemical baits, has been widely considered [4; 5; 6; 7].
The aim of this study was to observe if the trap baited with liver and ammonia is effective and also to determine the behavior of *Calliphora spp*. blowflies on and around the trap.

2. Materials and methods

The study was carried out in the Parasitic Disease Discipline Park of the Faculty of Veterinary Medicine Timisoara in the summer months of June and July of the year 2006.
Traps were manufactured manually from plastic wire and gauze with a central cone and four entrances of 1 cm^2 on each side of the four faces of the traps (Figure 1).
A Petri plate with liver imbibed with ammonia was placed under each trap to attract flies, but not to permit them to reach the liver.
Observations of fly behavior on and around a trap were recorded by a person seated on the ground approximately 3 m from the trap, at 90º to the prevailing wind direction. Time of landing on the trap, number of entry holes inspected and time of leaving were the recorded parameters.

* Corresponding author: Florica Morariu,
+40256277190, florimor@yahoo.com

Figure 1. A trap model used in the experiment (original).

3. Results and discussion

Three surveillances were done, during which 517 blowflies were monitored: 224 (43.32%) of *Calliphora* genus, 139 (26.89%) of *Lucilia* genus and 71 (13.74%) of *Protophormia* one, respectively.

Table 1 shows data obtained for *Calliphora* genus, after monitoring. Even these blowflies are the first one which appear around the trap, it can be observed that, in the first 8 seconds, only a small number of them inspected the trap: 41 (18.30%).

The most number of blowflies was recorded inside the 8-14 seconds interval, when 114 (50.89%) flies of the genus spent their time in trap inspection activities. Then comes a decreasing but constant trend, between 14-26 seconds interval, in which 65 flies (29.02%) insisted on this odorous cue finding behavior. Very few blowflies, exactly 4 (1.79%), continued to inspect the trap between 26-30 seconds interval.

Actually, over 75% of these blowflies spent more than 10 seconds on the trap, hopping to find the attractive odorous cue.

These aspects are shown in Figure 2.

It was observed that the *Calliphora* genus is more „insistent", approximately 50% of blowflies staying between 8 and 14 seconds on the trap, and almost 1/3rd of them spending 14 to 30 seconds on it.

This "lazy" behavior of blowflies belonging to *Calliphora* genus could be rather explained by the fact that these flies are engorged and matted, seeking insistently for a favorable place for oviposition.

Dymock and Forgie [8] carried out surveillance for 3 years in the northern New Zealand, using the same type of trap but switching the baits.

Excluding the synthetic baits, the used ones were the following: fish decay solution, unskinned lamb carcasse watered with fish decay solution, and sheep heart, lungs, liver and bowels, respectively.

The main collected species were: *Chrysomya rufifacies*, *Calliphora stygia*, *Lucilia sericata* and *L. cuprina*. Surprinsingly, they observed that sheep offals were more attracting for *Ch. rufifacies*, who represented 63.5-84.8% of captures and *C. stygia*, with 13.2-31.1% of captured individuals.

Same results concerning *Calliphora* genus were obtained by us.

Table 1. Time spent on standard trap by blowflies of *Calliphora* genus.

Genus	Time (seconds)														
	0-1.9	2-3.9	4-5.9	6-7.9	8-9.9	10-11.9	12-13.9	14-15.9	16-17.9	18-19.9	20-21.9	22-23.9	24-25.9	26-27.9	28-30
Calliphora (n = 224)	4(1.78%)	8(3.57%)	11(4.91%)	18(8.03%)	49(21.87%)	38(16.96%)	27(12.05%)	16(7.14%)	10(4.46%)	9(4.02%)	13(5.80%)	8(3.57%)	9(4.02%)	3(1.34%)	1(0.45%)

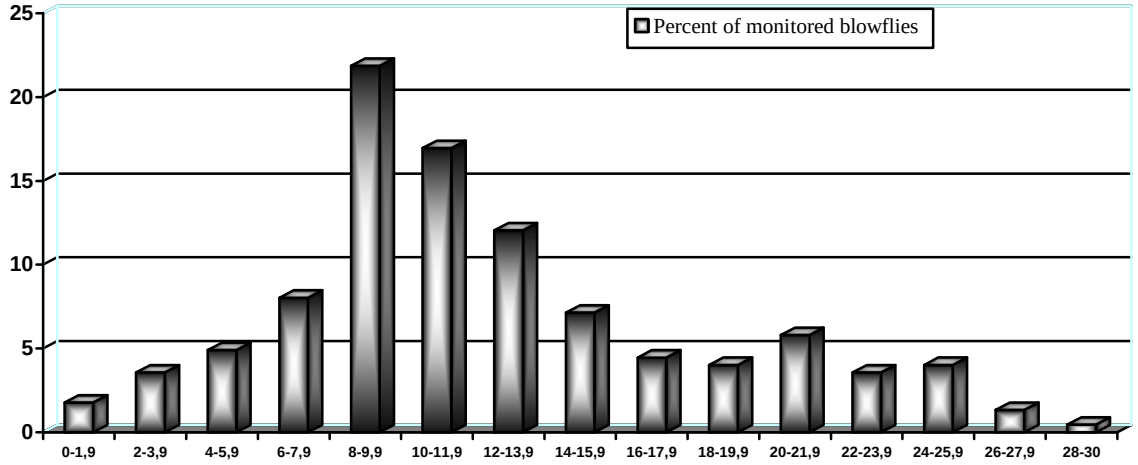

Figure 2. Frequency distribution of time spent by blowflies of *Calliphora* genus on standard trap baited with liver and ammonia.

4. Conclusions

Concerning *Calliphora* genus, 50.89% of blowflies spend between 8 and 14 seconds on the standard trap, and almost 1/3rd (30.81%) stayed between 14 and 30 seconds, respectively.

Over 75% of these blowflies spent more than 10 seconds on the trap, by searching behavior of this.

References

1. Heath, A.C.G., Bishop, D.M., Flystrike in New Zealand, *Surveillance*, 1995, 22, 11–13.

2. Heath, A.C.G., Bishop, D.M., Flystrike in New Zealand: An overview based on a 16-year study, following the introduction and dispersal of the Australian sheep blowfly, *Lucilia cuprina* Wiedemann (Diptera: Calliphoridae), *Vet. Parasitol*., 2006, 137, 333-344.

3. Hall, M., Wall, R., Myiasis of humans and domestic animals, *Adv. Parasitol.*, 1995, 35, 257–334.

4. Dymock, J.J., Forgie, S.A., Large-scale trapping of sheep blowflies in the northern North-Island of New Zealand using insecticide-free traps, *Aust. J. Exp. Agric*., 1995, 35, 699–704.

5 Scholtz, A.J., Cloete, S.W.P., Laubscer, J.M., de Beer, E.F., A preliminary evaluation of a sheep blowfly trap in the Western Cape, *J. S. Afr. Vet. Assoc*., 2000, 71, 144–147.

6. Smith, K.E., Wall, R., Suppression of the blowfly *Lucilia sericata* using odour-baited triflumuron-impregnated targets, *Med. Vet. Entomol*., 1998, 12, 430–437.

7. Ward, M.P., Farrell, R., Sheep blowfly strike reduction using a synthetic lure system, *Prev. Vet. Med*., 2003, 59, 21–26.

8. Dymock, J.J., Forgie, S.A., Habitat preferences and carcase colonization by sheep blowflies in the northern North Island of New Zealand. *Med. Vet. Entomol*., 1993, 7, 155-160.