FORENSIC ENTOMOLOGY APPLIED TO DATING OF ATTACKS FROM WOLF

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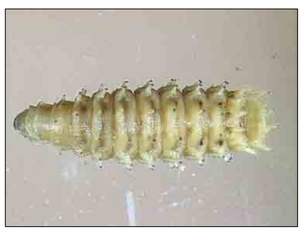
In the frame of a long-term study of wolf biology and management, we tried to develop a protocol to allow timing of predation events from insects collected on the prey.

The carcasses were frequently monitored and adult and immature insects were sampled on their surface and the most accessible internal parts. Insects were then examined and classified. Further sampling was carried out of domestic animals predated in the province of Cuneo, during two consecutive summers (2006 and 2007).

The study was conducted in the Maritime Alps Park, a representative context where wolf attacks may occur. For each of four periods (May to October), six roe deer carcasses were laid out at different altitudes (1000, 1500 and 2000 m).

Collection comprised adult specimens of Diptera and Coleoptera (9 and 6 families, respectively) and a limited number of larvae of Calliphoridae and Silphidae. The corresponding timing of appearance was as follows: L1 (first larval stage) Calliphoridae: 2-8 days, L2 (second larval stage) Calliphoridae: 4-10 days L3 (third larval stage): Lucilia sericata: 4-24 days, Calliphora vomitoria: 4-18 days, Chrysomya spp.: 13-17 days, Oiceoptoma thoracicum: 13 days, Thanatophilus rugosus: 20 days.



Based on these data, a formula was derived that, taking into account altitude, temperature and exposure, would reveal the post-mortem interval with good approximation.

$$\text{Giorni medi} \sim \text{Temperatura } x1 + \text{Esposizione } x2 + \text{Altitudine } x3 + \text{Stadio } x4 + \text{intercetta}$$

X1= temperatura media del periodo, senza distinzione di esposizione e altitudine
X2= 1 se esposto / 0 se non esposto
X3= Altitudine in metri
x4= 1 se L1 / 2 se L2 / 3 se L3

		1000		1500		2000	
		ombra	sole	ombra	sole	ombra	sole
L1	12°C	8.1 (7.6-8.5)	4.5 (4-4.9)	11.4 (11-11.9)	7.8 (7.4-8.3)	14.8 (14.3-15.2)	11.2 (10.7-11.6)
	15°C	6.4 (6-6.9)	2.8 (2.3-3.2)	9.8 (9.3-10.2)	6.1 (5.7-6.6)	13.1 (12.7-13.6)	9.5 (9.1-9.9)
	18°C	4.7 (4.3-5.2)	1.1 (0.7-1.6)	8.1 (7.6-8.5)	4.5 (4-4.9)	11.4 (11-11.9)	7.8 (7.4-8.3)
L2	12°C	11.1 (10.7-11.6)	7.5 (7.1-8)	14.5 (14-14.9)	10.9 (10.4-11.3)	17.8 (17.4-18.3)	14.2 (13.8-14.7)
	15°C	9.5 (9-9.9)	5.8 (5.4-6.3)	12.8 (12.4-13.3)	9.2 (8.7-9.6)	16.2 (15.7-16.6)	12.5 (12.1-13)
	18°C	7.8 (7.3-8.2)	4.2 (3.7-4.6)	11.1 (10.7-11.6)	7.5 (7.1-8)	14.5 (14-14.9)	10.9 (10.4-11.3)
L3	12°C	14.2 (13.7-14.6)	10.6 (10.1-11)	17.5 (17.1-18)	13.9 (13.5-14.4)	20.9 (20.4-21.3)	17.3 (16.8-17.7)
	15°C	12.5 (12.1-13)	8.9 (8.4-9.3)	15.9 (15.4-16.3)	12.2 (11.8-12.7)	19.2 (18.8-19.7)	15.6 (15.1-16)
	18°C	10.8 (10.4-11.3)	7.2 (6.8-7.7)	14.2 (13.7-14.6)	10.6 (10.1-11)	17.5 (17.1-18)	13.9 (13.5-14.4)

Permitting an objective timing of wolf attacks, results of this study may be exploited for management purposes, e.g. resolving disputes between field personnel and farmers for acknowledgement of the regional reimbursement for the damage suffered.