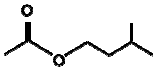

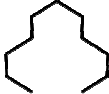
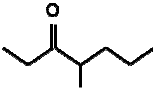
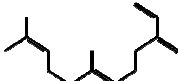
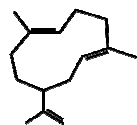


Table 1: Some identified alarm pheromones in the animal kingdom

Animals	Principal compounds	Typical behavioral responses	Additional observations	References
INSECTS				
Hymenopterans				
Honeybees	isopentyl acetate	Recruitment and aggression	Over 20 active compounds have been identified in various bee species. Guarding workers release alarm pheromone in case of perturbation, which leads to recruitment of nestmates and subsequent attack of the intruder.	Boch et al., 1962 Shearer and Boch, 1965
				
	2-heptanone			
				
Ants	<i>n</i> -undecane	Fright reactions	All Formicidae species were found to produce and use an alarm pheromone, whose secretion may simultaneously or exclusively ensures escape, recruitment of conspecifics and stimulates aggressive reactions	Hughes et al., 2001 Stoeffler et al., 2007
		or		
	4-methyl-3-heptanone	recruitment and aggression		
				
Homopterans				
Aphids	(E)- $\beta$ -farnesene	Fright reactions	Most Aphidinae species produced (E)- $\beta$ -farnesene as only alarm pheromone component. Individuals escape from the emitter by running away or falling of the plant	Edwards et al., 1973 Bowers et al., 1977b
				

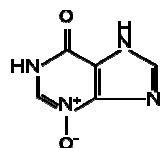
germacrene A



## FISH

### Ostariophysi

hypoxanthine-3-N-oxide



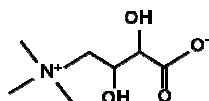
Fright reactions

Ostariophysan fish exhibit antipredator responses (increased shoaling and decreased area use) when exposed to conspecific skin extract, released by damaged skin. Exposure of low concentrations of hypoxanthine-3-N-oxide lead to increase vigilance towards secondary cues

Brown et al., 2004

## CNIDARIA

anthopleurine



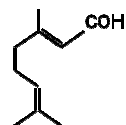
Fright reactions

Anthopleurine was the first reported cnidarian pheromone. The sea anemone *Anthopleura elegantissima*, released anthopleurine from wounded parts which evokes rapid withdrawal in nearby conspecifics

Howe and Sheikh, 1975

## MITES

citral



Fright reactions

Several families of mites produce citral as an alarm pheromone, whose perception induce in arachnids avoidance behavior along with an increased mobility

Kuwahara et al., 1980