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Role of aggregation pheromone in spatial dynamics of *Sinella coeca* (Collembola Entomobridae)

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The phenomenon of aggregation is one of the most analized behavioural aspects of Collembola (Usher, 1969). The studies of this phenomenon are usually based on the research of aggregation pheromone, and descriptive statistics about spatial distribution of individuals (Taylor, 1984). However, functional interpretation of aggregation may be advantaged by a dynamic approach for which aggregation is determined by the balance between dispersive and attractive factors (Turkin, 1989). These are the guidelines of the study presented relating to the aggregative behaviour of *Sinella coeca*, paying particular attention to the role of aggregative pheromone in spatial dynamics.

Dispersive factors are identified with the basic explorative activity. Its evolution over time has been studied in open fields through the analysis of short- and middle-term activity cycles. High-definition videorecording and digital processing of images allowed us to define the motion vectors. Attractive factors equate to the effects of aggregation pheromone emitted by *S. coeca*. Given that aggregative dynamics determined by chemical messages are a kinesis, an evalutation of the aggregative power of the pheromone has been infered from orthokinetic and klinokinetic reactions to a marked area (Kerkut & Gilbert, 1985). These experiments provided all the necessary data to implement a model informed to Artificial Life Sciences (Langton, 1989) which, on the basis of mechanistic individual behavioural rules, has allowed us to reproduce relevant spatial population dynamics. Simulation has highligted the relevance of the quantity of pheromone as well as the role of explorative strategies and the environmental structure in the triggering off and evolution of the aggregates. Therefore the adoption of a new theoretical approach and tecnologically advanced devices has permitted us to explane aggregated population structure on the basis of individual behaviour.

REFERENCES

Langton C. G. (ed), 1989 - Artificial life. Addison-Wesley, Redwood City, California.

Kerkut G. A., Gilbert L. I. (eds), 1985 - Comprehensive insect physiology biochemestry and pharmacology, Vol. 9: Behaviour. Pergamon Press, Oxford.

Taylor L. R., 1984 - Ann. Rev. Entomol., *29*: 321-357.

Turkin P., 1989 - J. anim. Ecol., *58*: 75-100.

Usher M. B., 1969 - J. anim. Ecol., *38*: 607-622.

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Vocal and behavioural repertoire and intensity of aggression of Tawny owls (*Strix aluco*) in response to playback of conspecific calls

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During a playback survey of Tawny owl population living in Pavia (northern Italy), I collected responses from 43 adults. Call types used and behaviour displayed by owls in response to conspecific calls were recorded and scored according to intensity of aggression evaluated on a scale ranging from 1 (min. aggressiveness) to 6 (max. aggressiveness). A number of variables possibly affecting behaviour and voice (sex, type of owl, season, time of night, weather, moon phase, habitat) were measured as well. Most responses (62.5%) came from males while female responses accounted only for 33.9% of the total. Six types of calls were used by both sexes in responding to playback trials, although in significantly different proportion (X^2 = 290.3, d. f. 6, P = 0.000), the commonest voice of responding males being the hoot (87%), while the females mainly used the contact-call (69%). We recorded seven main behaviours displayed by owls in response to playback. Males and females did not differ in behaviour during territorial contests, but females showed a higher aggression in voice used than males (F = 10.51; d. f. 1, 326; P = 0.0013). Moreover, the overall intensity of aggression significantly varied between types of owl, individuals in pairs being much more aggressive in voice used and behaviour than individuals alone (F = 4.39; d. f. 3, 324; P = 0.005). Aggressiveness did not vary according to season, time of night, weather and lighting, but lunar cycle significantly affected level of aggression: when the moon was up owls were more aggressive than in other phases. Habitat also influenced aggressiveness toward playback, owls living in the suburbs being more aggressive than those living in woodland, farmland and urban habitat. On the other hand, suburban owls responded less frequently to playback than other individuals. So Tawny owls showed two alternative strategies in defending territories: i) responding frequently and weakly, or ii) responding rarely but aggressively. This is probably due to social environment and quality of territories defended.