



AGONISTIC BEHAVIOURAL SEQUENCES IN A BOTTLENOSE DOLPHIN FAMILY GROUP

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INTRODUCTION

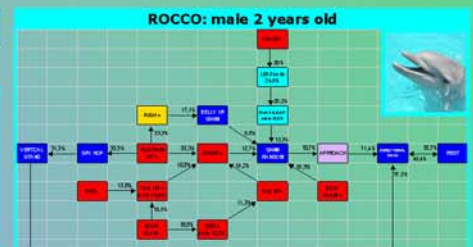
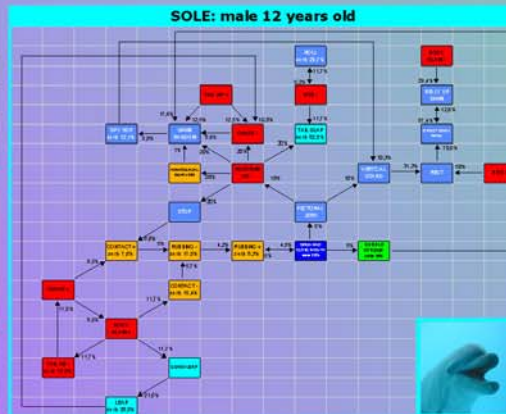
In addition to quantitative evaluations in terms of frequency and duration, behaviour can be described as sequences of modules consistently preceding or following others.

This approach was applied to the study of agonistic behaviour in a *Tursiops truncatus* family group, in order to categorize this ethological topic into a scheme of classification capable to reveal which components, starting from an aggressive display, occur together in a particular temporal sequence.

MATERIAL AND METHODS

Continuous behavioural observations lasting 15 minutes each were carried out in 2005 at Rimini Delfinario (Italy), reaching a total of 780 observations and 195 hours of sampling. The focal observations were equally distributed on 5 subjects strictly connected by lineal kinship: two adults, a male and a female (respectively approx. 35 and 26 year old), and their three calves, two males and one female (respectively 2, 12 and 10 year old). A specific behavioural catalogue and Observer Lag Sequential Analysis (Noldus) were applied to obtain for each individual transition matrices and significant flux diagrams ($p < 0.05$).

RESULTS



As expected for highly social mammals, all subjects manifested varied agonistic behavioural situations with significant ($p < 0.05$) concatenations of displays. However, a different development of successions depending on age, experience and role inside the group emerged. In particular, a clear difference in sequence features appeared between the most distant-in-age bottlenose dolphins. In fact, while, after an aggression, the youngest calf Rocco displayed a very high number of transitions, revealing a juvenile hyperactivity and the possession of an already wide behavioural repertoire - if first to attack he immediately uses intense blows such as rostrum or tail hits, if victim of a physical assault he usually reacts chasing and trying to bite the aggressor, if chased he flees leaping and randomly swimming, until searching at the end the mother support - the adult male never reacted. Very simply, Speedy, from the high of his consolidated hierarchic position, even if chased or bitten still maintains his standing position or, at least, slowly moves away swimming on his flank. Analogously, only the other adult, Alfa, mother of all calves, exhibited sequences including threat and warning behaviours, suggesting how these acts, capable of reducing the probability of ulterior attacks, are effective only if performed by a strong recognized member of the community.

CONCLUSIONS

Agonistic behaviour, typically characterized by a complex combination of aggression, defence, reconciliation and avoidance, confirm to represent a fundamental component of the communicative system of dolphins and to sustain with its costs and benefits, the dynamics of their social equilibriums.

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