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From genotype to phenotype: influence of the gut microbiota in Japanese quails (*Coturnix japonica*)

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HAL Authorization

Flexibility of social networks in zoo chimpanzees

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Within stable groups animals are part of a network of dynamic inter-individual interactions. Network dynamics are not well understood and little is known about the influence of social or ecological change on individuals' social positions. Here I investigated the impact of social change on individual grooming network positions in a group of zoo chimpanzees. The social change was a gradual change in the alpha male that began at the start of the study and lasted two and a half years. Data on grooming partners were collected using instantaneous scan sampling. I identified three periods of varying stability in the male hierarchy, extracting a three-month subset of data from each period: (1) unstable with no clear alpha male; (2) recently stable with the new alpha male in position for one month; and (3) stable, when the new alpha male had been in position for two years. I created weighted and unweighted grooming networks analysing changes in degree, eigenvector and betweenness centrality using repeated measures ANOVA with bootstrapped p values. Stability in the male hierarchy affected network metrics (degree only) for females but not males. Both weighted indegree (grooming received) and outdegree (grooming given) were significantly higher for females in the stable period compared to the unstable or recently stable periods. The same was true for unweighted degree in females. Thus females were better connected within their grooming networks in the stable period. The findings are consistent with the view that female chimpanzees exhibit greater flexibility in their social strategies than males.

From genotype to phenotype: influence of the gut microbiota in Japanese quails (*Coturnix japonica*)

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Gut microbiota (GM) manipulation is an emerging approach for studying animal behaviour and its underlying mechanisms. The aim of our study was to test the hypothesis that the GM of the Japanese quail can influence its behavioural phenotype. In a first experiment, we compared the behavioural responses of 36 germ-free quails (devoid of GM) of a line genetically selected for its high emotionality trait (E+ line) and 36 germ-free quails of this same line colonised at birth with GM from the E+ line. Results showed that compared to colonised quails, the germ-free quails had a lower tonic immobility duration and traveled a smaller distance during the social isolation test, suggesting that the absence of GM reduces emotional reactivity of the quails. In a second experiment, we hypothesised that the GM of a quail line with a low emotionality trait (E- line) would reduce emotional reactivity of the E+ line. After hatching in germ-free conditions, chicks of the E+ line were distributed in two isolators and inoculated at Day 1 with the GM of quails of their line (group E+ / GM+) or with the GM of the line with a low emotionality trait (group E+ / GM-). Tonic immobility duration of the group E+ / GM- was lower than that of the group E+ / GM+ at Day 15. In conclusion, the absence of GM or the colonisation with a foreign GM are able to influence the development of relevant behaviours of the host in birds.

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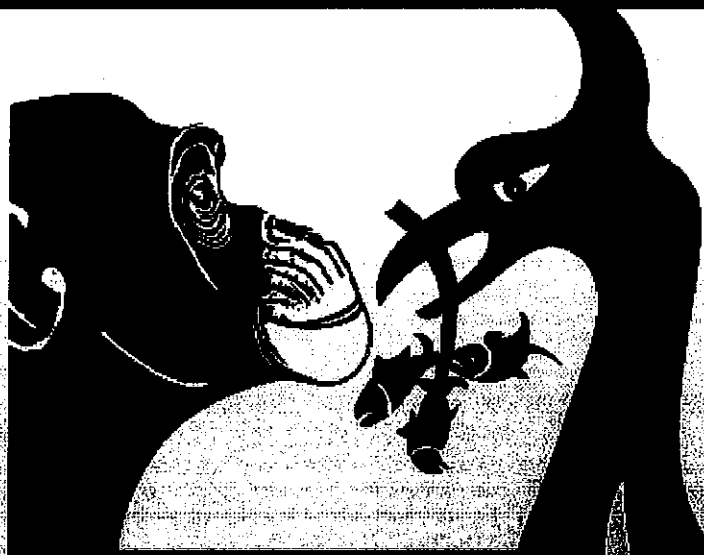
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Corrections:

Talk cancellation: E. Millesi; M. Nemeth; D. Schuster; B. Wallner. *Effects of dietary fatty acids on cortisol secretion, postnatal development and social behaviour in guinea pigs.*

Abstract in poster section now presented as a talk: V. Puehringer-Sturmayr, J. Hemetsberger, K. Kotrschal, D. Frigerio. *Paternal stress in successful Northern bald ibis males: Behavioural, physiological and parasite load evidence.*



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