



High variation of kynurenic acid levels in dropping samples of birds

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Background: The tryptophan metabolite Kynurenic acid (KYNA) is present in the intestine and studies showed that its concentration increases along the small intestine reaching the highest concentration at the very end. We were interested to study kynurenic acid in dropping samples of birds.

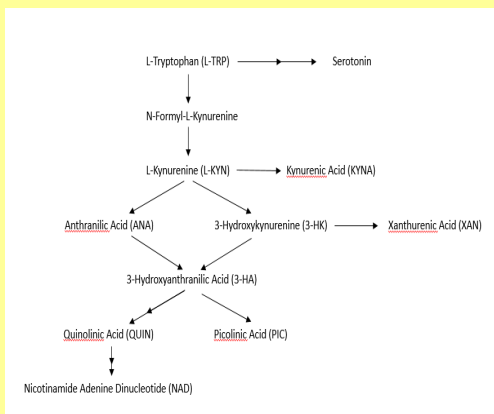


Fig. 1: Overview of the Tryptophan metabolism.



Fig. 2: Golden Eagle (*Aquila chrysaetos*).



Fig. 3: Hen Harrier (*Circus cyaneus*).



Fig. 4: Eurasian Blue Tit (*Parus caeruleus*).



Fig. 5: Great Spotted Woodpecker (*Dendrocopos major*).

Methods: KYNA concentrations in bird droppings from 10 domesticated golden eagles (7 females, 3 males) and from 3 wild birds (*Dendrocopos major*, *Circus cyaneus*, *Parus caeruleus*) were measured via HPLC. Dropping samples of golden eagles were investigated over a period of 11 weeks (1 sample per week).

Conclusion: Higher KYNA concentrations in bird dropping samples might be due to species differences, different sorts of food (meat vs. insect and vegetarian food) or differences in the composition of the gut microbiome.

Fluctuations in the amount of KYNA over a period of 11 weeks could be due to hormonal changes of the eagles. We could not observe significant differences between female and male eagles.

Results: KYNA concentrations were in nanomolar range per mg feces (Fig.6). KYNA concentrations differed significantly between single birds ($p < 0.05$).

No significant differences could be observed between male and female eagles (Fig.7).

Over a period of 11 weeks the analyzed samples in some eagles showed high variations in concentration of KYNA, whereas in others it remained relatively stable. ANOVA analysis of variance with respect to time revealed no significant differences (Fig.8).

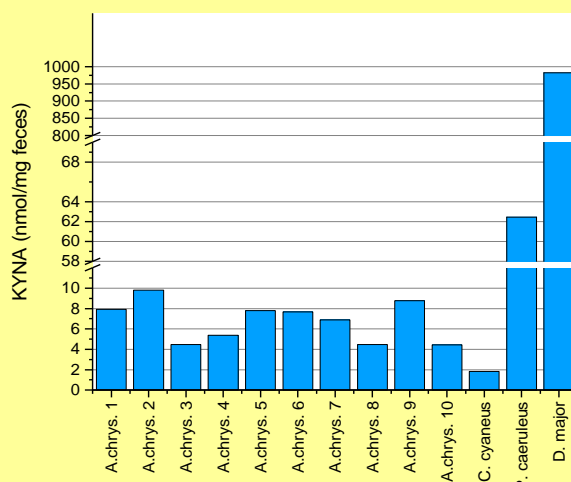


Fig. 6: KYNA concentration in bird droppings of different birds; A.chrys: *Aquila chrysaetos* (Golden Eagle), C. cyaneus: *Circus cyaneus* (Hen Harrier), P. caeruleus: *Parus caeruleus* (Blue Tit), D. major: *Dendrocopos major* (Great Spotted Woodpecker).

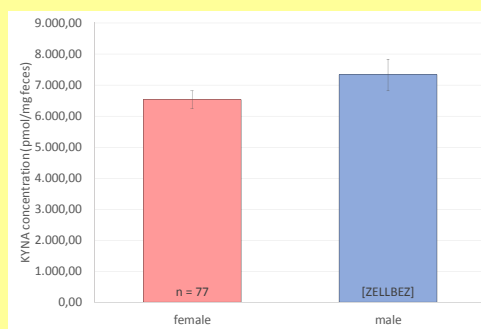


Fig. 7: KYNA concentration in bird droppings of female and male eagles; mean values of 7 female and 3 male eagles \pm SEM.

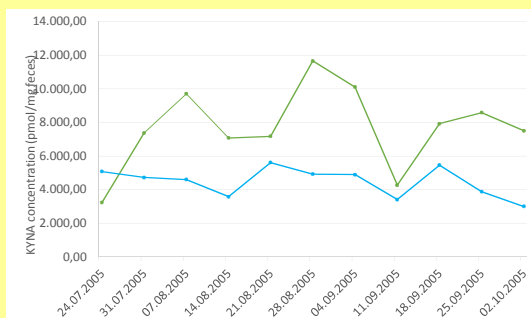


Fig. 8: KYNA concentration in bird droppings of 2 eagles over a period of 11 weeks (1 sample per week).