

Determination of testosterone and corticosterone in feathers of barn swallows (*Hirundo Rustica*)

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The level of endocrine mediators of individual fitness, such as stress hormones or sex hormones is monitored in various matrices. Regarding the birds, testosterone and corticosterone are usually measured in the blood plasma. Plasma sampling gives a snapshot of the concentration of steroids and its metabolites at the time of capture. Concentration levels of corticosterone culminate within several minutes after initiation of stress stimulus with initiation of the increase sometimes in less than 3 minutes. Similarly, concentration level of testosterone decreases with stress in association with elevated corticosterone. On the other hand feathers gradually accumulate hormones during their growth. The measuring of hormone levels in feather provides information about plasma hormone levels over a longer time period. Therefore the analysis of feathers can offer valuable information about stress levels and condition of an individual bird.

A new analytical method has been applied to assess the occurrence of the hormones (testosterone and corticosterone) in bird feathers. Derivatization of target hormones was used in order to significantly enhance the LC-ESI-MS/MS signal. The methanol extract of hormones was cleaned-up by solid phase extraction and derivatized immediately before LC-ESI-MS/MS analyses. The AmplifexTM Keto Reagent kit was used for derivatization of hormones at keto groups. This approach to the analysis significantly improves the identification of target hormone in feather samples, distinctly enhances sensitivity of the analytical method and decreases limits of detection.

Our study was focused on determination of feather steroids especially in barn swallow (*Hirundo Rustica*). Feather from flanks were collected for analysis for hormone concentrations. Birds from three isolated farms in South Bohemia, Czech Republic were caught for this purpose.

Key words:

Feather, Steroids, Corticosterone, Testosterone, HPLC-ESI-MS/MS, Barn swallow (*Hirundo Rustica*)

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