



# Changes in the metabolic profile of urine from mink during early pregnancy

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## Introduction

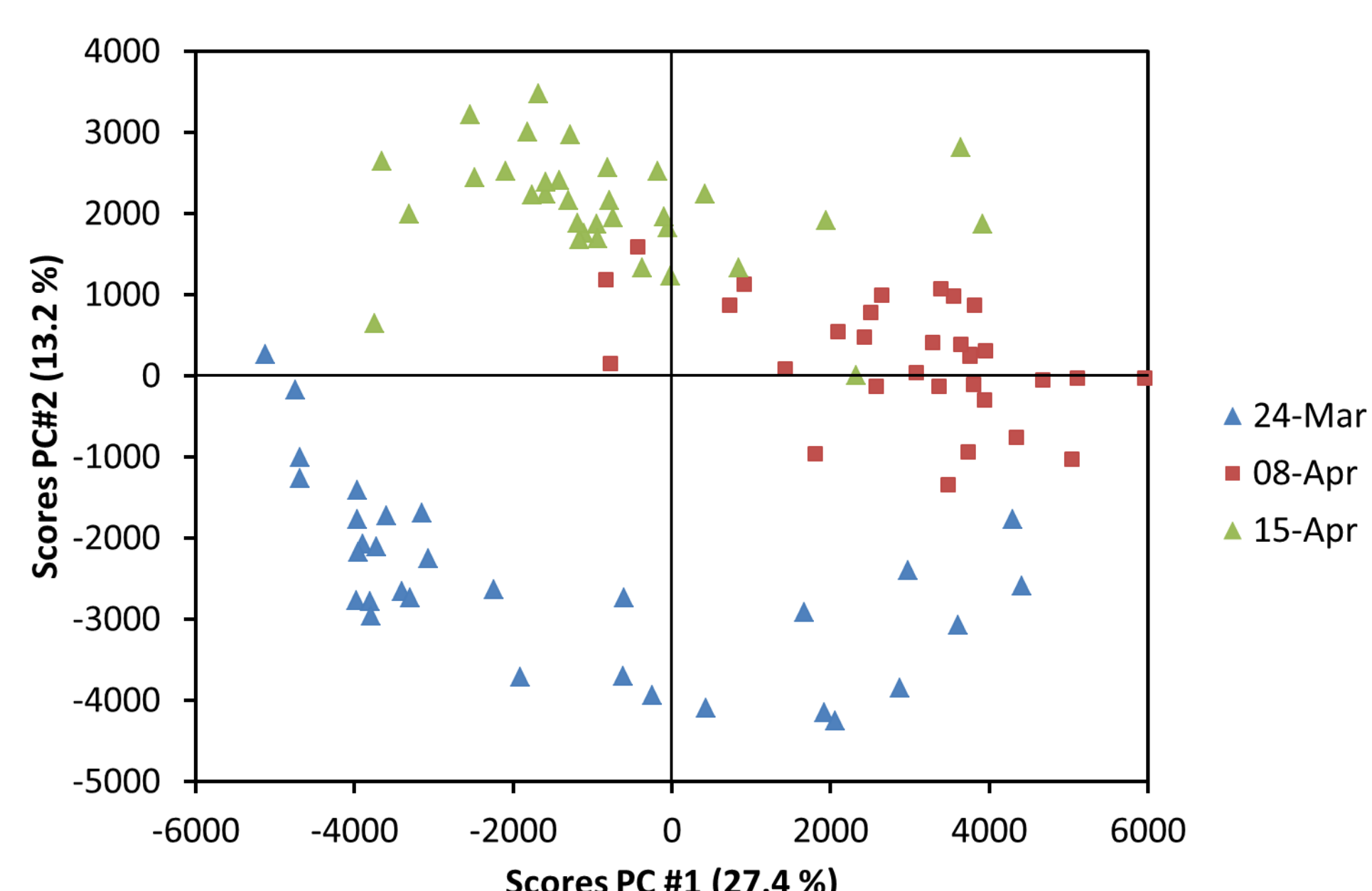
Metabolomic strategies have been employed to understand the metabolic adaptation of the organism to pregnancy. The glomerular filtration rate increases during pregnancy and it is known that the excretion of amino acids, carnitines, glucose, and folate increases. The present study was undertaken to study the metabolic changes in mink urine during pregnancy.

## Conclusion

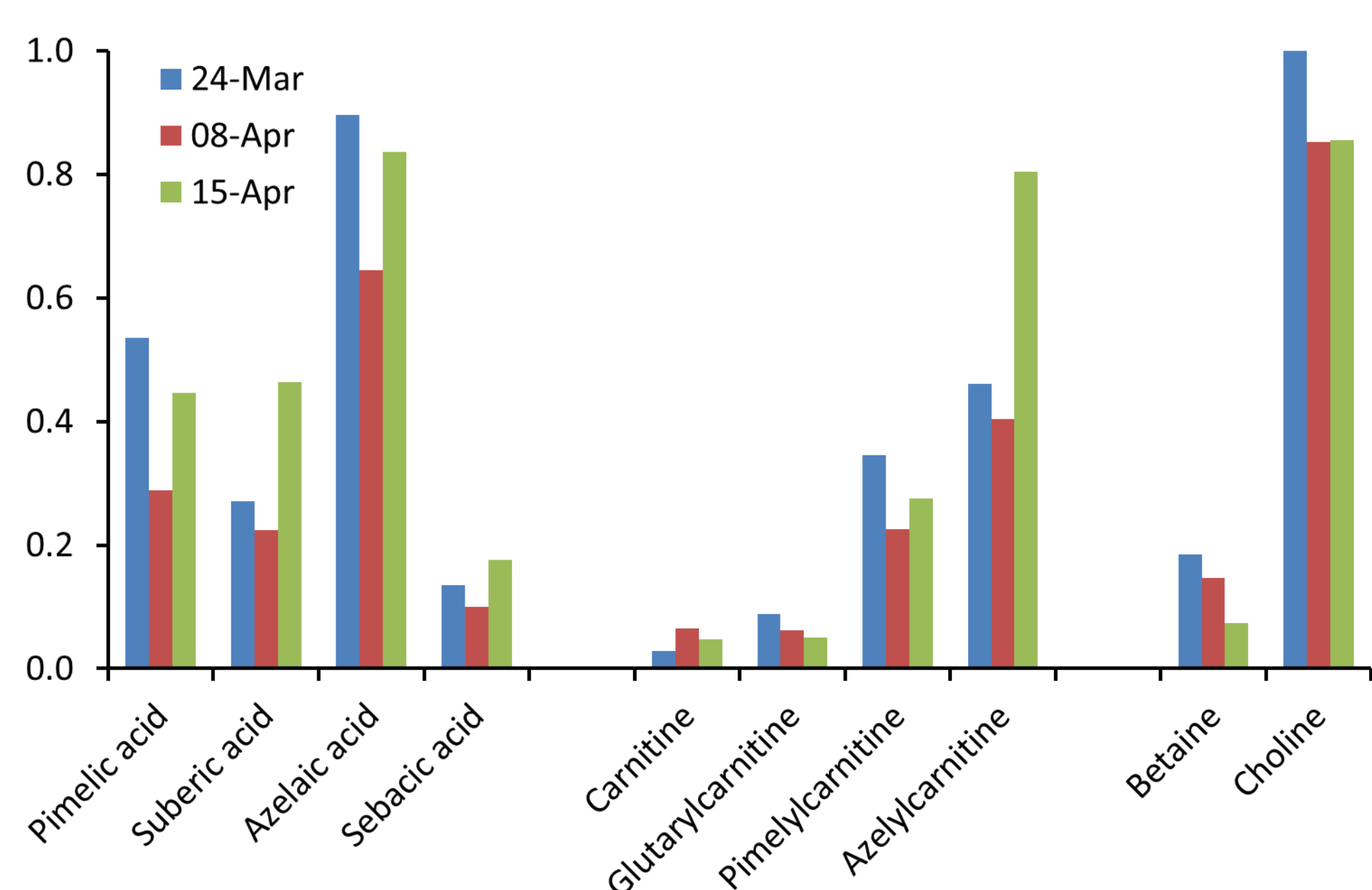
Metabolic profiling of urine from pregnant mink showed that  $\beta$ -oxidation as well as protein metabolism is changed during pregnancy in mink and it is hypothesized that the changes occur to ensure optimal nutrition of the foetuses.



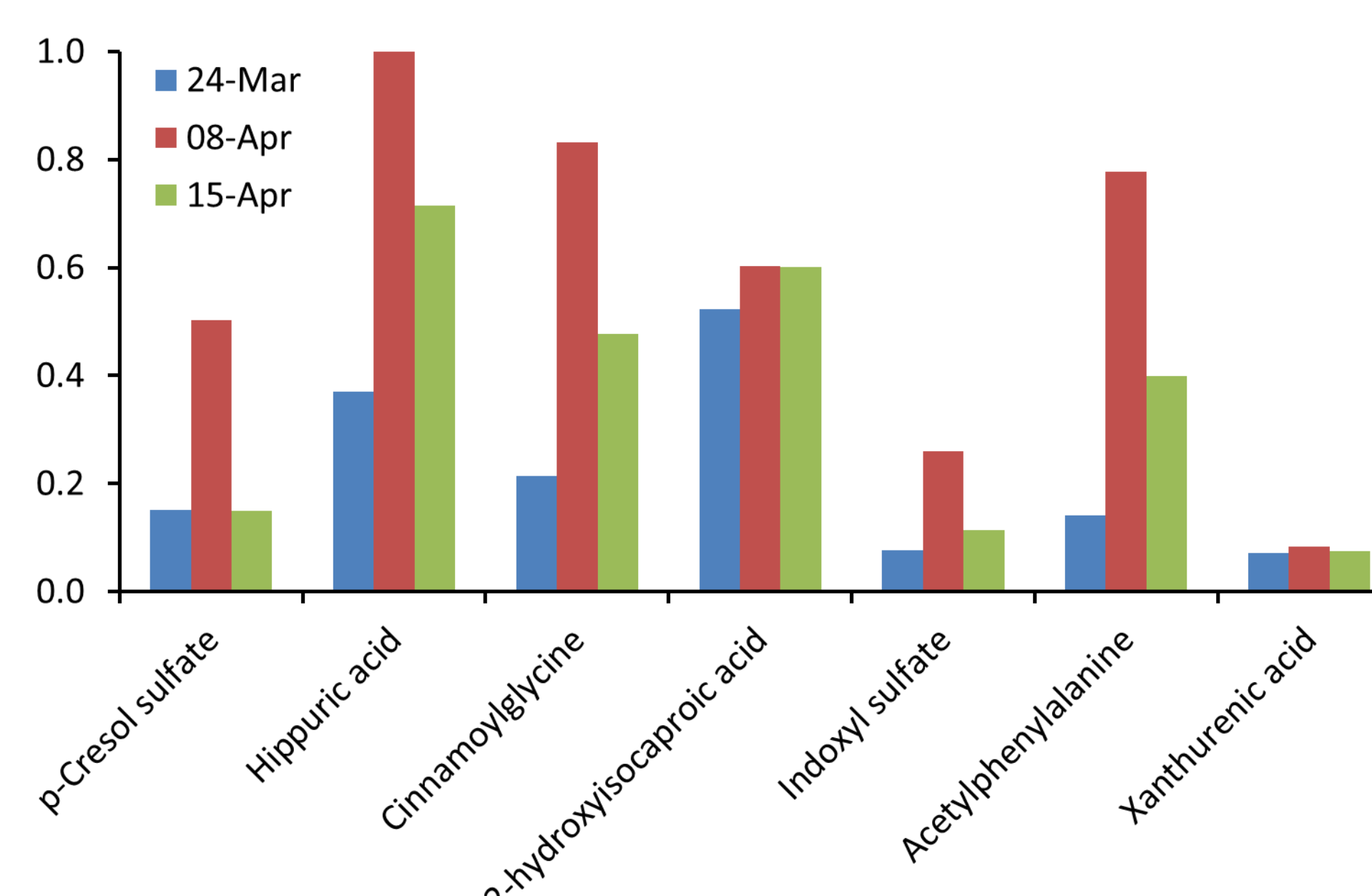
## Results and Discussion



PCA score plot of data from non-targeted metabolomics analysis of urine samples from mink collected at three points during early pregnancy. A clear separation was observed between the three days of collection.

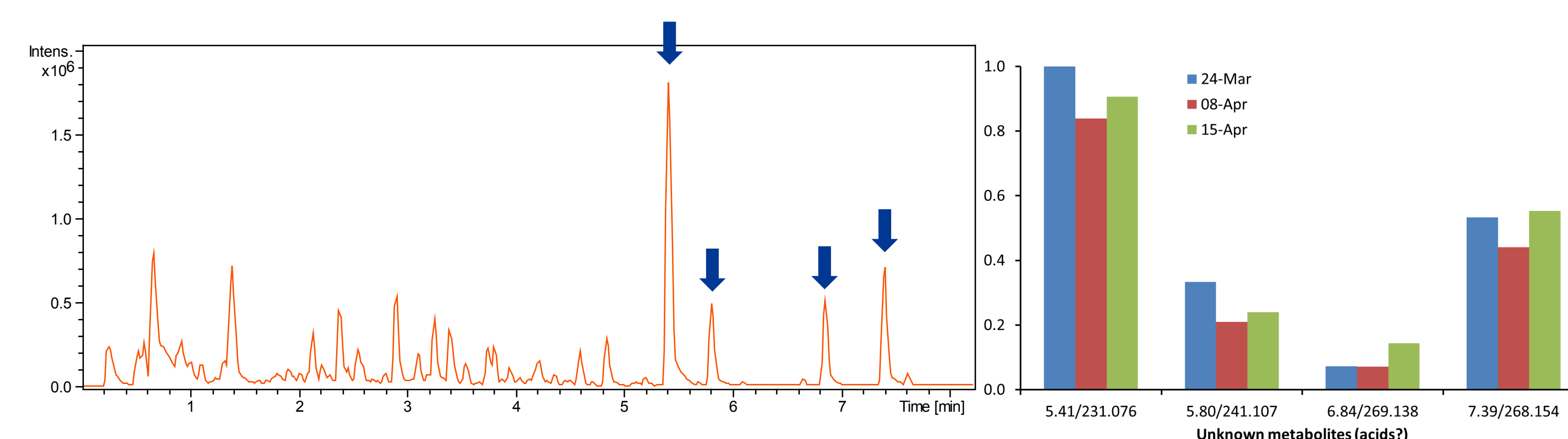


The excretion of dicarboxylic acids and their corresponding carnitines followed a characteristic pattern with a transient decrease in the excretion on April 8. In contrast, the excretion of free carnitine is increased on April 8. Due to high need for choline during pregnancy the excretion of choline is decreased and a parallel decrease in the excretion of betaine is observed.



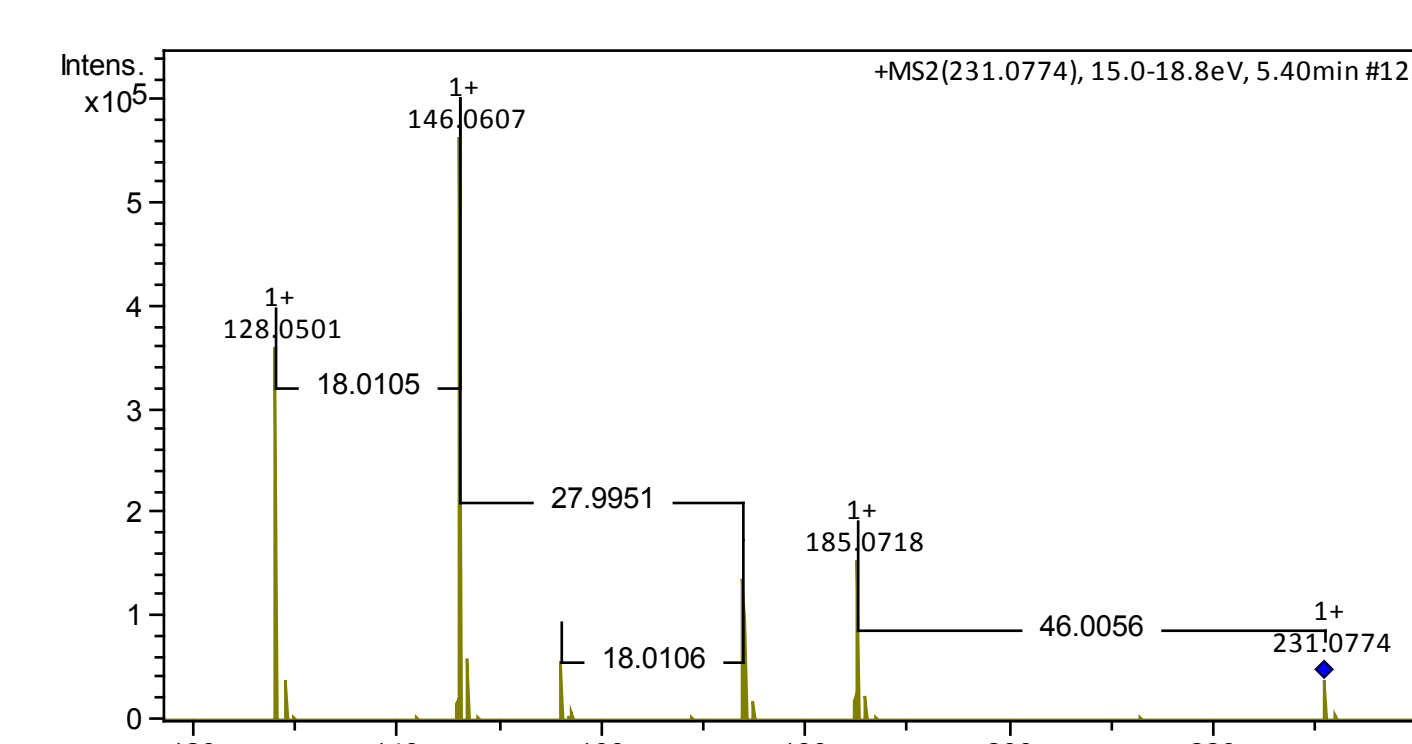
The concentration of several metabolites of protein metabolism was increased on April 8 followed by a decrease to a level that was higher than or equal to the level observed on March 24.

### Four unknown high-intensity metabolites:



Base peak chromatogram of a urine sample in positive mode. Four unknown metabolites – probably acids – are marked.

The intensity of the metabolites differed significantly between collection days



MS/MS fragmentation pattern of the metabolite with  $m/z$  231.076. Suggested formula:  $C_{12}H_{10}N_2O_3$ . The identity of the metabolite still needs to be confirmed.

## Materials and methods

Urine samples were collected from pregnant mink on three days (March 24, April 8, and April 15, 2015) during early pregnancy. The samples were prepared for non-targeted LC-MS (90  $\mu$ l urine + 90  $\mu$ l  $H_2O$  + 20  $\mu$ l acetonitril with internal standard (Glycocholic acid (Glycine- $1^{13}C$ ), final concentration 0.01 mg/ml). The samples were injected to a UHPLC equipped with a C18-column (HSS T3, Waters corporation) and the eluent was introduced into a Ultra-High Resolution Qq-Time-Of-Flight mass spectrometer (Impact HD, Bruker Daltonics GmbH, Bremen, Germany). Data analysis was performed using Bruker Compass DataAnalysis (v. 4.2), ProfileAnalysis (v. 2.1) and Latentix (v. 2.10).

