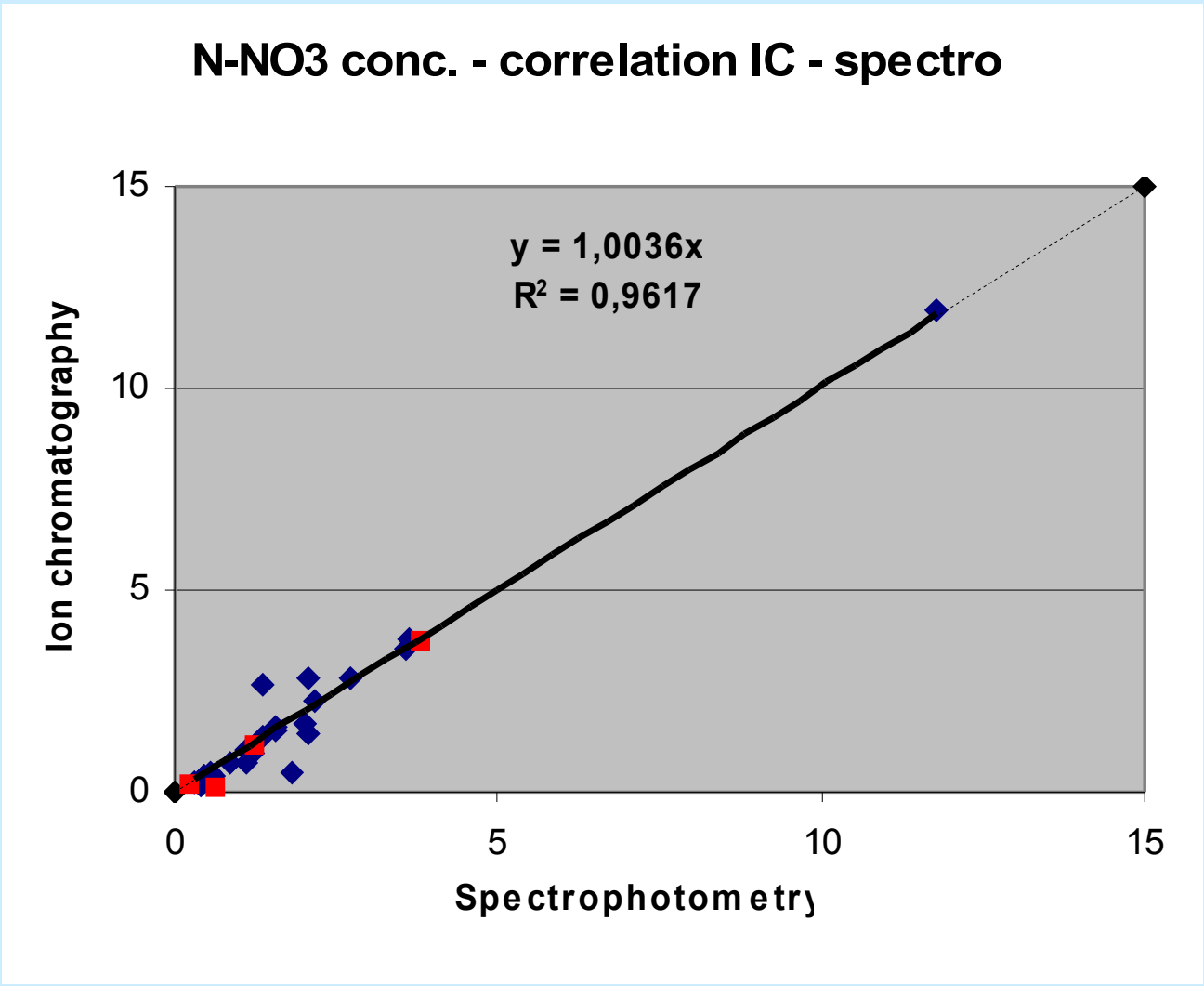
COMPARISON BETWEEN N-NH4 and N-NO3 CONCENTRATIONS IN WATER SAMPLES, MEASURED by SPECTROPHOTOMETRY and ION CHROMATOGRAPHY

Carmen Iacoban
Forest Research Station Campulung Moldovenesc
ROMANIA
iacoban.carmen@icassv.ro

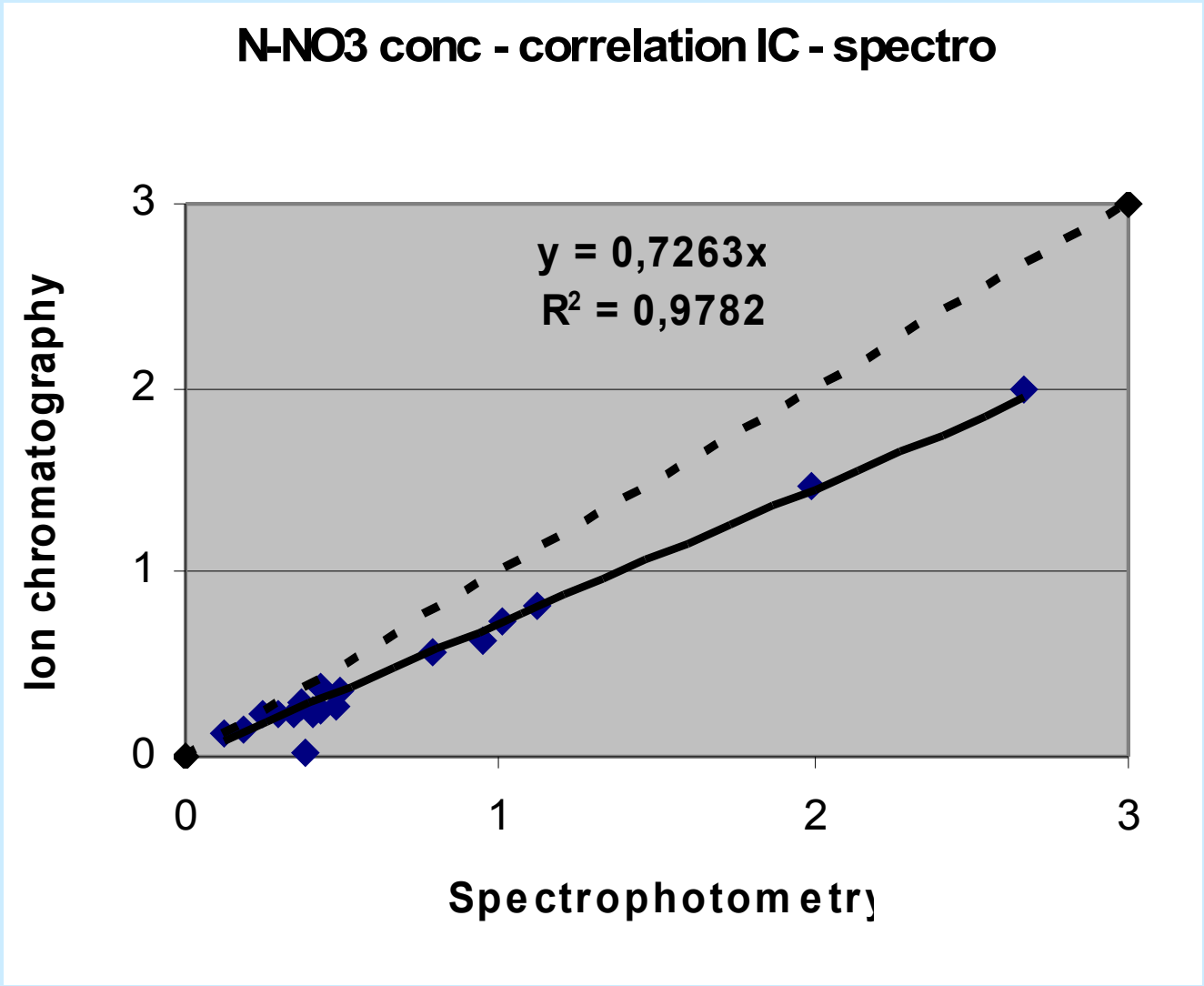
Precipitation and soil solution samples, collected from February until July 2009 were analyzed in our lab, in the same day, by spectrophotometry and ion chromatography, in order to establish the comparability of results, for N-NH4 and N-NO3 concentrations.

Methods

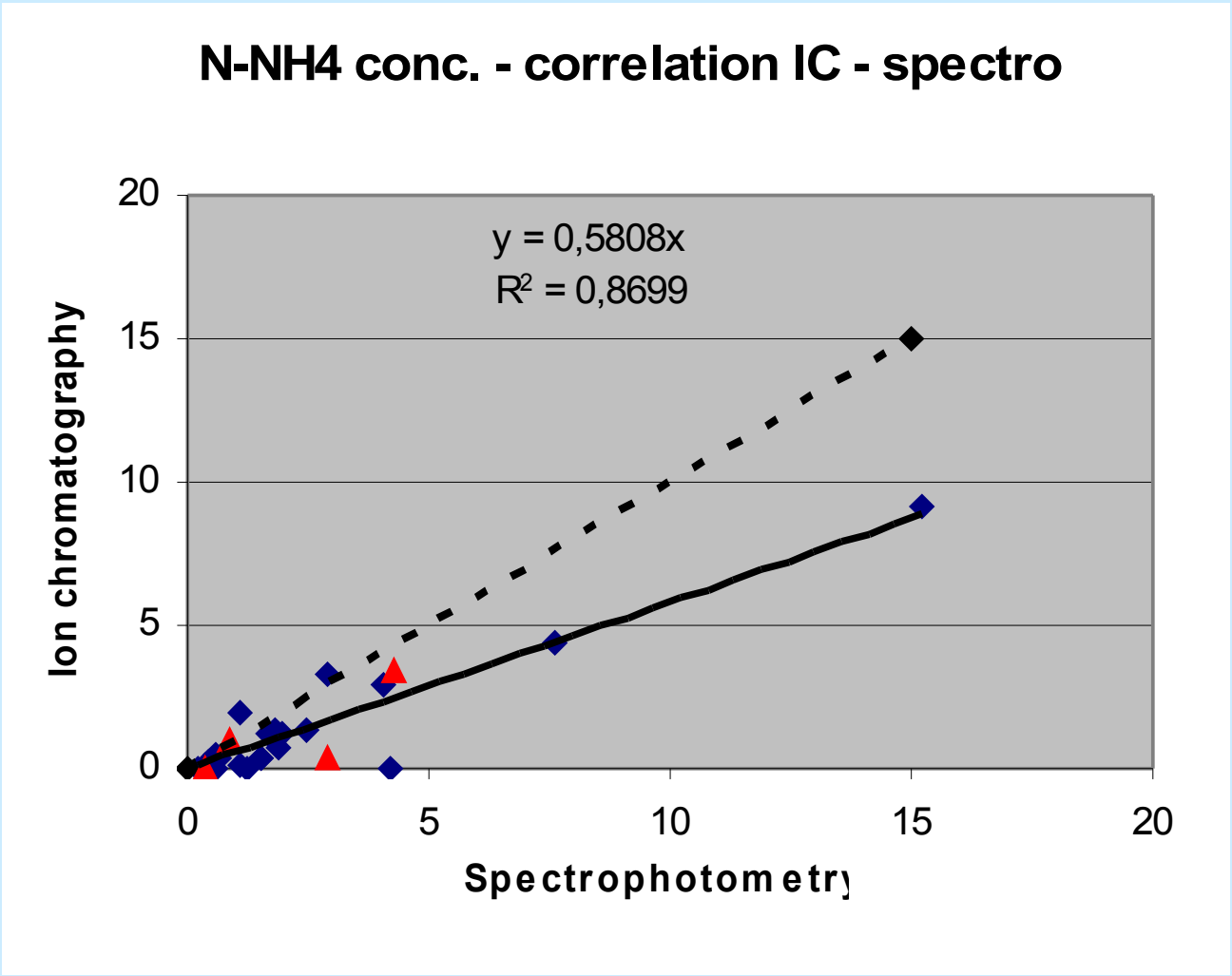
- Spectrophotometry
    - Nessler's method, for N-NH_4
    - Sodium salicylate method, for N-NO_3
- Ion chromatography
    - eluent: solution of H_2SO_4 for cations analysis (including N-NH_4)
    - eluent: solution of $NaHCO_3$ and $NaCO_3$ for anions analysis (including N-NO_3)



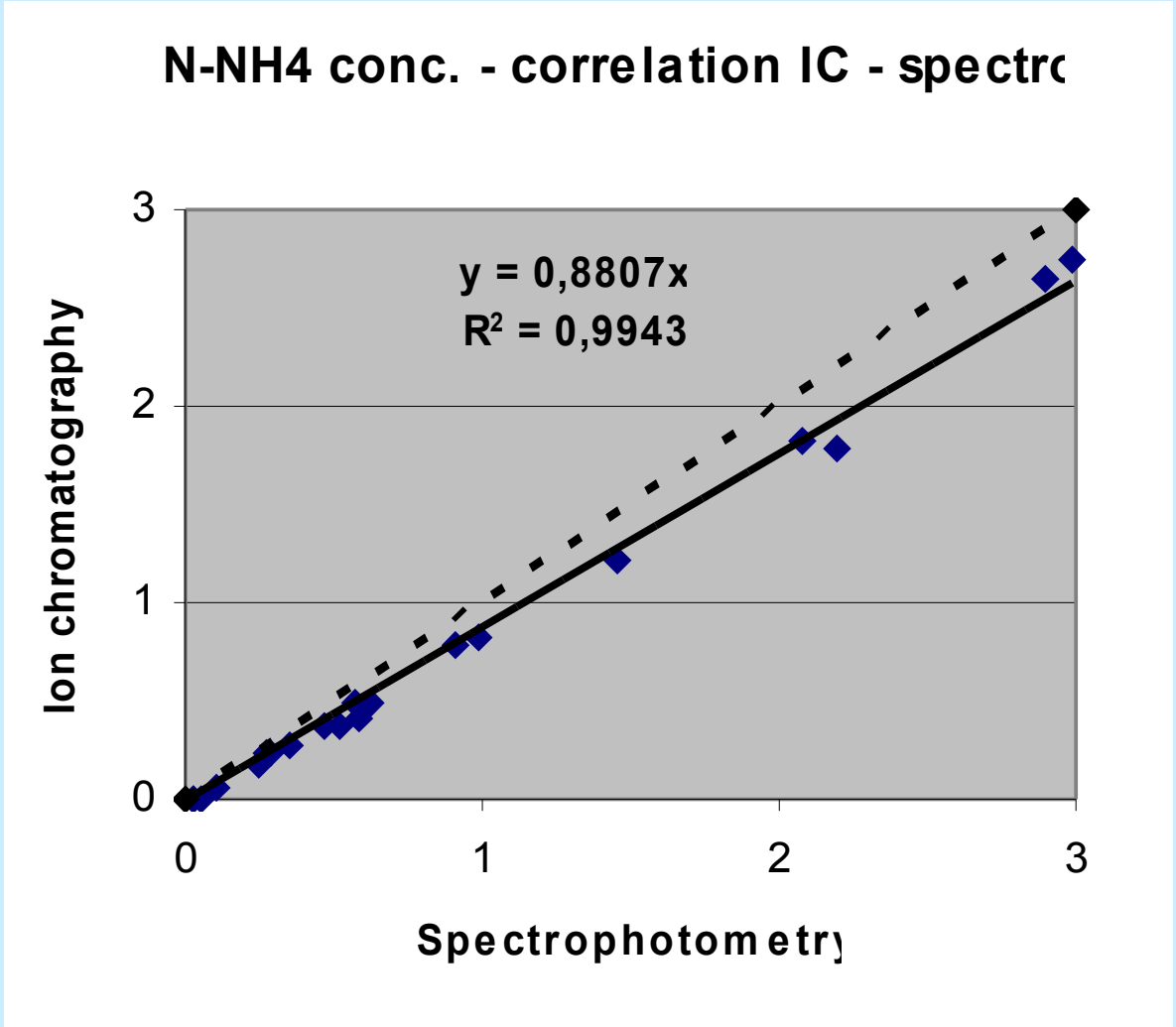
28 throughfall and soil solution samples (with red, the 4 ring test samples)



20 bulk deposition samples



27 throughfall and soil solution samples (with red, the 4 ring test samples)



20 bulk deposition samples

CONCLUSIONS

- The concentrations of ammonium and nitrate determined by spectrophotometry were generally higher than those measured by ion chromatography
- For throughfall and soil solution samples

  NO3 (IC) ~ NO3 (SP)

  NH4 (IC) = 42% lower than NH4 (SP)
- For bulk deposition

  NO3 (IC) = 27% lower than NO3 (SP)

  NH4 (IC) = 12% lower than NH4 (SP)

- Our laboratory and the others that used these spectrophotometric methods for nitrate and ammonium measurements overestimated the results and implicit the concentrations and fluxes of mineral nitrogen in forest ecosystems.

Thank you for attention!