**ELECTRONIC SUPPLEMENTARY MATERIAL**

# Selenium uptake and biotransformation and effect of selenium exposure on the essential and trace elements status: comparative evaluation of four edible plants

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**Table 1SM.** Total selenium and trace elements found in the biomass of four plants exposed to different Se(IV) concentrations.

| Concentration found in the biomass, mean ± SD, µg $g^{-1}$ (dry mass), n=3 | | | | | | |
|---|---|---|---|---|---|---|
| Se in the growth medium, mg $L^{-1}$ | Mn | Ni | Cu | Zn | Se | Mo |
| | | | Radish | | | |
| 0 | 87.9 ± 2.6 | 27.7 ± 0.8 | 55.0 ± 1.7 | 111 ± 3 | 0.99 ± 0.1 | 394 ± 5 |
| 0.25 | 82.6 ± 2.6 | 8.61 ± 1.1 | 48.6 ± 1.9 | 95.1 ± 3.2 | 19.5 ± 0.8 | 381 ± 3 |
| 0.5 | 76.0 ± 2.3 | 5.55 ± 0.4 | 45.4 ± 1.4 | 90.6 ± 2.7 | 35.0 ± 1.1 | 376 ± 5 |
| 1.0 | 89.1 ± 2.7 | 6.84 ± 0.2 | 52.4 ± 1.6 | 97.2 ± 2.9 | 68.2 ± 2.1 | 439 ± 7 |
| 5.0 | 60.2 ± 3.5 | 4.21 ± 1.3 | 50.6 ± 2.6 | 81.3 ± 5.3 | 141 ± 7.4 | 465 ± 10 |
| 10 | 56.3 ± 4.3 | 3.65 ± 2.1 | 53.9 ± 2.8 | 76.5 ± 2.1 | 203 ± 5.1 | 501 ± 12 |
| | | | Alfalfa | | | |
| 0 | 105 ± 2 | 6.19 ± 0.2 | 26.3 ± 0.8 | 128 ± 4 | 2.89 ± 0.1 | 863 ± 9 |
| 0.25 | 146 ± 4 | 5.74 ± 0.2 | 27.8 ± 0.8 | 185 ± 5 | 20.7 ± 0.4 | 1363 ± 12 |
| 0.5 | 142 ± 1 | 5.48 ± 0.2 | 26.0 ± 0.7 | 119 ± 3 | 39.1 ± 0.7 | 1512 ± 14 |
| 1.0 | 154 ± 5 | 4.70 ± 0.1 | 27.1 ± 0.8 | 141 ± 4 | 75.0 ± 1.4 | 1512 ± 10 |
| 5.0 | 185 ± 6 | 2.02 ± 1.0 | 33.6 ± 1.0 | 105 ± 3 | 176 ± 4.6 | 1592 ± 8 |
| 10 | 164 ± 5 | 2.44 ± 1.2 | 31.5 ± 0.9 | 98.0 ± 2 | 215 ± 6.3 | 1771± 12 |
| | | | Sunflower | | | |
| 0 | 53.9 ± 2.3 | 19.2 ± 0.2 | 32.7 ± 0.7 | 92.0 ± 3.3 | 3.43 ± 0.1 | 753 ± 4 |
| 0.25 | 67.8 ± 3.1 | 5.41 ± 0.1 | 35.4 ± 0.8 | 98.0 ± 2.7 | 35.1 ± 0.2 | 918 ± 3 |
| 0.5 | 68.9 ± 3.4 | 4.33 ± 0.3 | 31.4 ± 0.5 | 84.0 ± 2.6 | 54.2 ± 0.2 | 882 ± 6 |
| 1.0 | 60.7 ± 2.9 | 5.38 ± 0.1 | 31.8 ± 0.8 | 84.8 ± 3.0 | 105 ± 1 | 765 ± 4 |
| 5.0 | 62.5 ± 2.6 | 4.03 ± 0.1 | 31.5 ± 0.7 | 77.7 ± 3.1 | 159 ± 2 | 674 ± 2 |
| 10 | 67.2 ± 2.9 | 2.29 ± 0.1 | 31.2 ± 1.6 | 63.2 ± 2.3 | 239 ± 5 | 686 ± 8 |
| | | | Chard | | | |
| 0 | 867 ± 10 | 11.6 ± 0.3 | 37.6 ± 1.1 | 83.6 ± 2.5 | 4.04 ± 0.1 | 434 ± 7 |
| 0.25 | 745 ± 7 | 13.2 ± 0.4 | 35.6 ± 1.9 | 98.4 ± 3.3 | 6.25 ± 0.4 | 596 ± 10 |
| 0.5 | 763 ± 9 | 12.8 ± 0.6 | 38.9 ± 0.8 | 96.3 ± 4.3 | 8.03 ± 0.3 | 623 ± 9 |
| 1.0 | 613 ± 8 | 13.1 ± 0.4 | 30.0 ± 0.9 | 99.6 ± 2.9 | 12.5 ± 0.5 | 677 ± 15 |
| 5.0 | 723 ± 11 | 12.1 ± 0.3 | 39.7 ± 1.2 | 105 ± 3.1 | 70.2 ± 2.1 | 600 ± 14 |
| 10 | 656 ± 9 | 15.1 ± 0.5 | 39.3 ± 1.1 | 112 ± 3 | 108 ± 6 | 444 ± 12 |

**Table 2SM.** Concentrations of major elements found in the biomass of four plants under exposure to Se(IV).

| Element found in the biomass, mean ± SD, µg $g^{-1}$ (dry mass), n=3 | | | | | |
|---|---|---|---|---|---|
| Se in the growth medium, mg $L^{-1}$ | Ca | Na | Fe | Mg | K |
| Radish | | | | | |
| 0 | 11.2 ± 0.2 | 7.29 ± 0.0 | 0.91 ± 0.0 | 6.98 ± 0.1 | 47.8 ± 0.2 |
| 0.25 | 10.5 ± 0.2 | 7.52 ± 0.1 | 0.82 ± 0.0 | 7.15 ± 0.0 | 45.7 ± 0.6 |
| 0.5 | 11.5 ± 0.5 | 7.01 ±0.2 | 0.60 ± 0.0 | 6.83 ± 0.0 | 43.2 ± 0.3 |
| 1.0 | 11.9 ± 0.2 | 7.75 ± 0.1 | 0.68 ± 0.0 | 7.14 ± 0.1 | 44.8 ± 0.6 |
| 5.0 | 9.63 ± 1.5 | 7.75 ± 0.1 | 0.54 ± 0.0 | 8.35 ± 0.1 | 41.3 ± 0.7 |
| 10 | 8.54 ± 2.1 | 7.75 ± 0.1 | 0.50 ± 0.0 | 8.95 ± 0.1 | 42.0 ± 0.1 |
| Alfalfa | | | | | |
| 0 | 2.33 ± 0.8 | 1.10 ± 0.0 | 0.13 ± 0.0 | 7.41 ± 0.0 | 29.9 ± 0.2 |
| 0.25 | 3.22 ± 0.0 | 1.04 ± 0.0 | 0.12 ± 0.0 | 6.63 ± 0.0 | 31.6 ± 0.6 |
| 0.5 | 3.08 ± 0.0 | 1.06 ± 0.0 | 0.13 ± 0.0 | 6.43 ± 0.0 | 32.9 ± 0.2 |
| 1.0 | 2.95 ± 0.2 | 1.02 ± 0.0 | 0.14 ± 0.0 | 6.34 ± 0.1 | 32.8 ± 0.2 |
| 5.0 | 4.76 ± 0.0 | 0.44 ± 0.0 | 0.11 ± 0.0 | 4.52 ± 0.0 | 36.3 ± 0.3 |
| 10 | 4.50 ± 0.6 | 0.48 ± 0.0 | 0.12 ± 0.0 | 4.40 ± 0.0 | 36.0 ± 0.2 |
| Sunflower | | | | | |
| 0 | 5.06 ± 0.7 | 0.92 ± 0.0 | 0.27 ± 0.0 | 7.16 ± 0.0 | 19.0 ± 0.2 |
| 0.25 | 6.65 ± 0.5 | 1.71 ± 0.0 | 0.16 ± 0.0 | 10.1 ± 0.0 | 22.1 ± 0.0 |
| 0.5 | 5.53 ± 1.7 | 1.48 ± 0.0 | 0.15 ± 0.0 | 9.51 ± 0.0 | 18.6 ± 0.3 |
| 1.0 | 6.02 ± 0.5 | 1.43 ± 0.0 | 0.13 ± 0.0 | 8.62 ± 0.0 | 19.1 ± 0.0 |
| 5.0 | 5.73 ± 0.1 | 1.57 ± 0.0 | 0.14 ± 0.0 | 7.76 ± 0.0 | 20.4 ± 0.0 |
| 10 | 6.77 ± 0.1 | 1.50 ± 0.0 | 0.14 ± 0.0 | 8.84 ± 0.0 | 23.2 ± 0.1 |
| Chard | | | | | |
| 0 | 3.91 ± 0.1 | 17.2 ± 0.1 | 0.68 ± 0.0 | 13.2 ± 0.0 | 96.8 ± 0.8 |
| 0.25 | 3.62 ± 0.2 | 16.5 ± 0.1 | 0.72 ± 0.0 | 11.9 ± 0.1 | 99.3 ± 0.6 |
| 0.5 | 3.81 ± 0.2 | 14.2 ± 0.1 | 0.91 ± 0.0 | 12.1 ± 0.1 | 101 ± 1 |
| 1.0 | 3.75 ± 0.1 | 9.72 ± 0.2 | 0.89 ± 0.0 | 11.4 ± 0.0 | 107 ± 1 |
| 5.0 | 3.81 ± 0.2 | 13.9 ± 0.1 | 0.97 ± 0.0 | 11.6 ± 0.1 | 99.0 ± 1.1 |
| 10 | 3.73 ± 0.2 | 13.1 ± 0.1 | 1.21 ± 0.0 | 12.2 ± 0.0 | 80.3 ± 0.7 |

Fig 1SM. Principal components analysis (PCA) of element concentration levels found in biomass of four plants under different conditions of exposure to Se(IV): a) Two-dimensional plot of the sample scores and b) Two-dimensional plot of variable loadings in the space defined by the first two principal components.

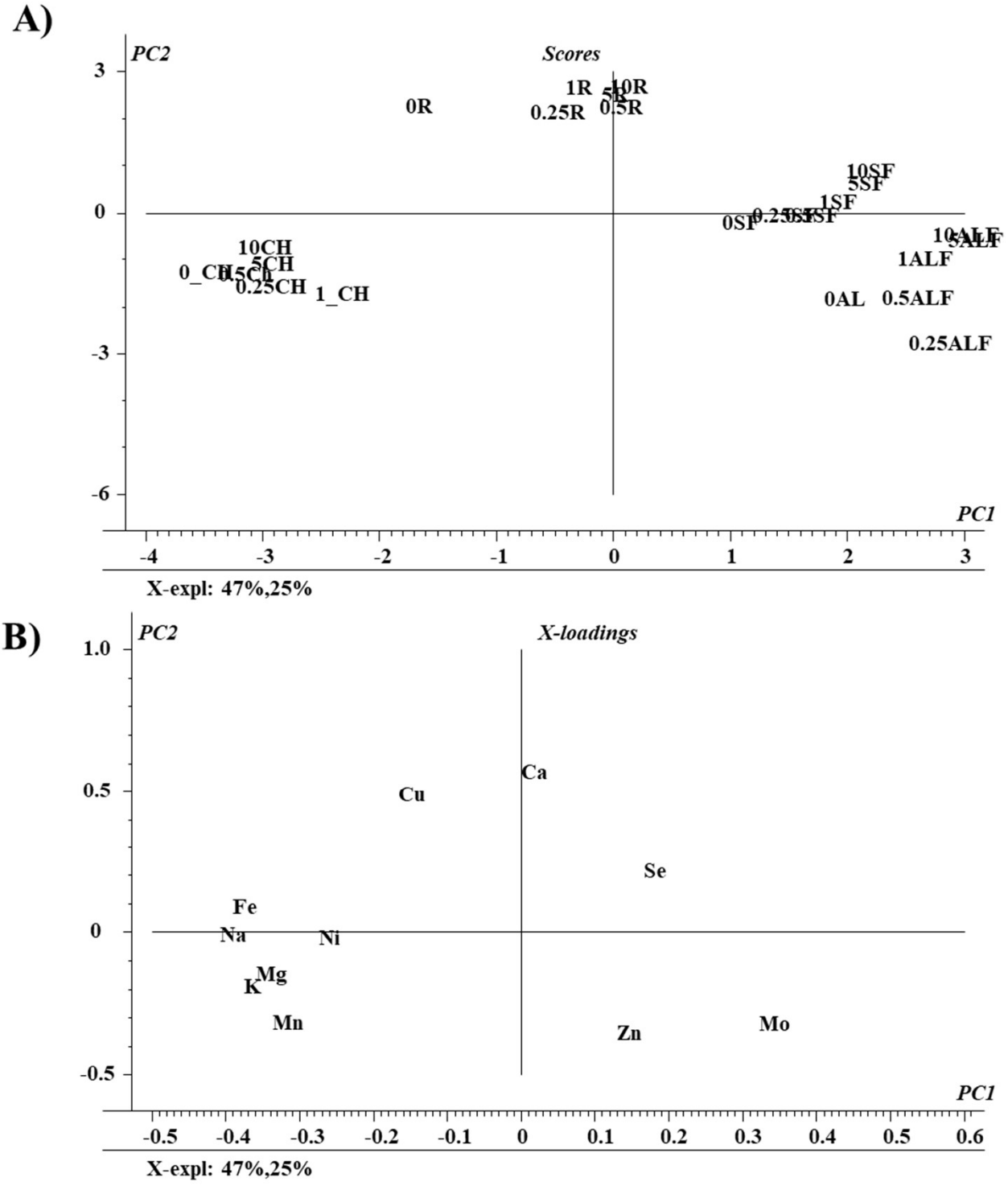

Fig 2SM. Principal components analysis (PCA) of element concentration levels found in biomass of radish under different conditions of exposure to Se(IV): a) Two-dimensional plot of the sample scores and b) Two-dimensional plot of variable loadings in the space defined by the first two principal components.

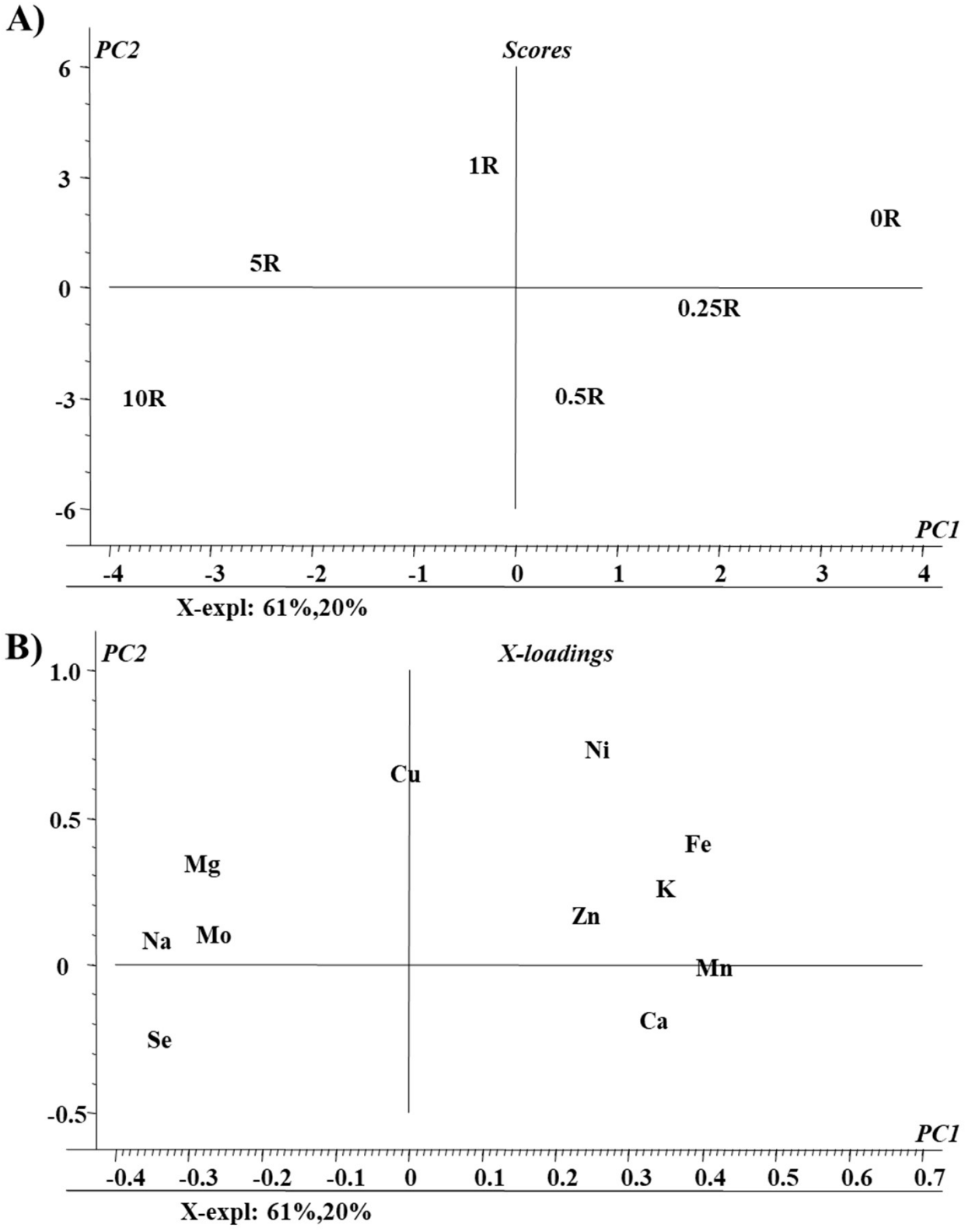

Fig 3SM. Principal components analysis (PCA) of element concentration levels found in biomass of sunflower under different conditions of exposure to Se(IV): a) Two-dimensional plot of the sample scores and b) Two-dimensional plot of variable loadings in the space defined by the first two principal components.

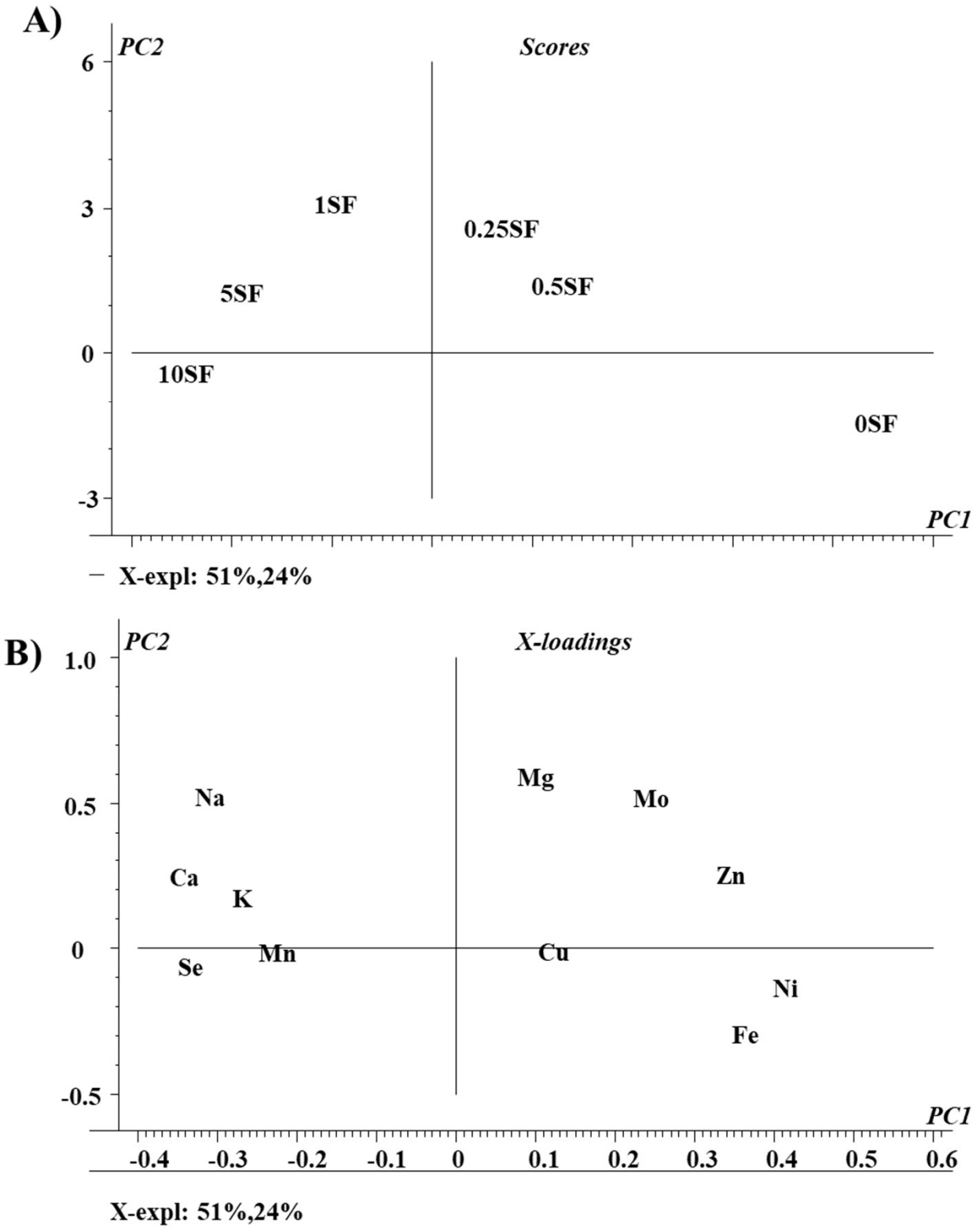

Fig 4SM. Principal components analysis (PCA) of element concentration levels found in biomass of chard under different conditions of exposure to Se(IV): a) Two-dimensional plot of the sample scores and b) Two-dimensional plot of variable loadings in the space defined by the first two principal components.