

**Semimetals (As)**

**5**



Arsenic (As) has been analyzed in a number of fungal sporocarps (Byrne et al. 1976; Kalač et al. 1991; Slekovec & Irgolic 1996). High arsenic concentrations are characteristic of the genus *Agaricus* (Vetter, 1994). However, little is known about the accumulation of As by fungal mycelia and its contribution to the total element content. No difference in As concentration in bulk soil and rhizosphere has been found, when soil-root interface fraction contains lower amounts of the elements (Table 5.1, unpublished data).

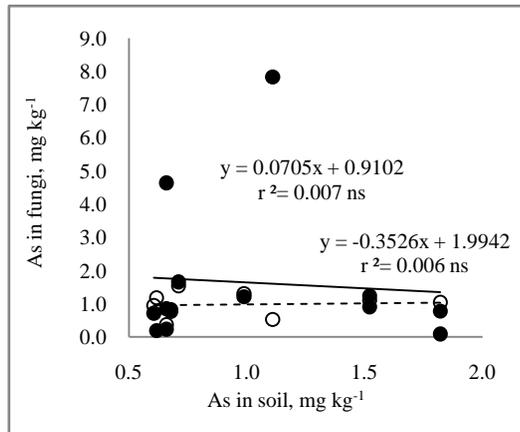
**Table 5.1** Mean concentration of arsenic ( $\text{mg kg}^{-1}$  DW) in soil fractions and fungi and bioconcentration ratios (BCR), mean values  $\pm$  standard deviation.

Bulk soil	Rhizosphere	Soil-root-interface	Fungal mycelium	Fruit bodies
Element concentration <sup>1</sup>				
0.97 $\pm$ 0.44 <sup>a</sup>	1.0 $\pm$ 0.34 <sup>a</sup>	0.66 $\pm$ 0.29 <sup>b</sup>	0.98 $\pm$ 0.37 <sup>a</sup>	1.63 $\pm$ 2.19
Bioconcentration ratios				
-	1.19 $\pm$ 0.51	0.70 $\pm$ 0.18	1.16 $\pm$ 0.63	2.01 $\pm$ 2.40

<sup>1</sup>Means within rows with different letters (a or b) are significantly different ( $p < 0.01$ ). BCR defined as concentration of the element ( $\text{mg kg}^{-1}$  DW) in the specific fraction divided by concentration of the element ( $\text{mg kg}^{-1}$  DW) in bulk soil).

The concentration of arsenic in mycelium was almost the same as concentration in the soil and about 1.5 times higher in fruit bodies than in mycelium. Thus, arsenic does not appear to be accumulated by mycelium and only moderately by fruit bodies of fungi (CR = 1.6). *Cortinarius* spp. tend to accumulate higher amounts of As than other species.

There was no relationship between the concentration of As in fungal sporocarps or soil mycelium and concentration in the soil in which they are growing (Figure 5.1).



**Figure 5.1** Relationships between concentration of As in fungal sporocarps (filled circle, solid line) and soil mycelium (non-filled circle, dotted line) in relation to the soil in which they are growing.

The values for soil mycelium biomass are space between 30 and 60 mg DW of mycelium per one gram DW of soil. With the assumption, the dry bulk density in the upper layers of the soil in the Forsmark study area is  $0.4 \text{ g cm}^{-3}$  (Lundin et al. 2004), and the As concentration in bulk soil and mycelium (Table 5.1.), it appears fungal mycelium accumulate between 3.0 and 6.1% of the total As in soil.