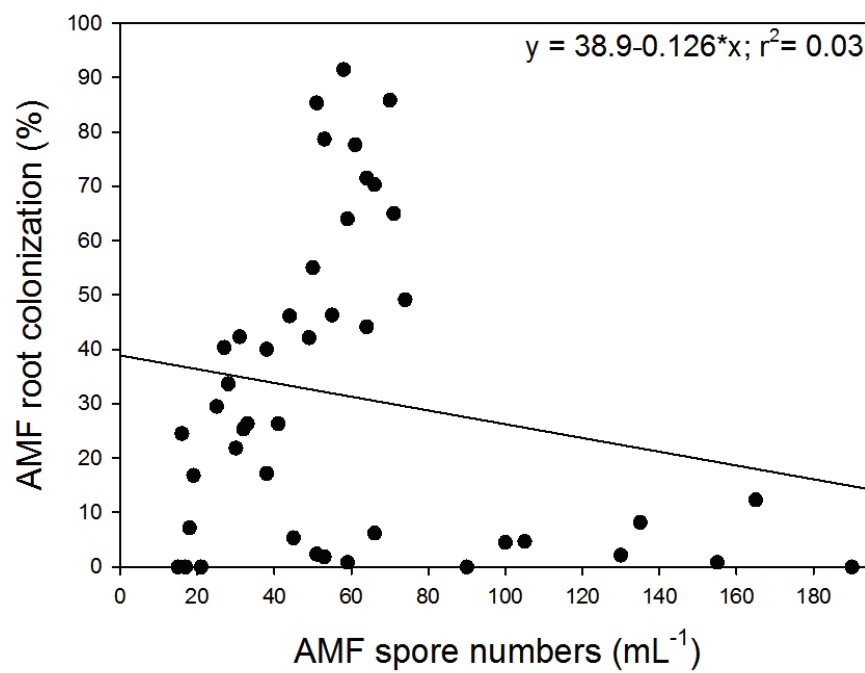


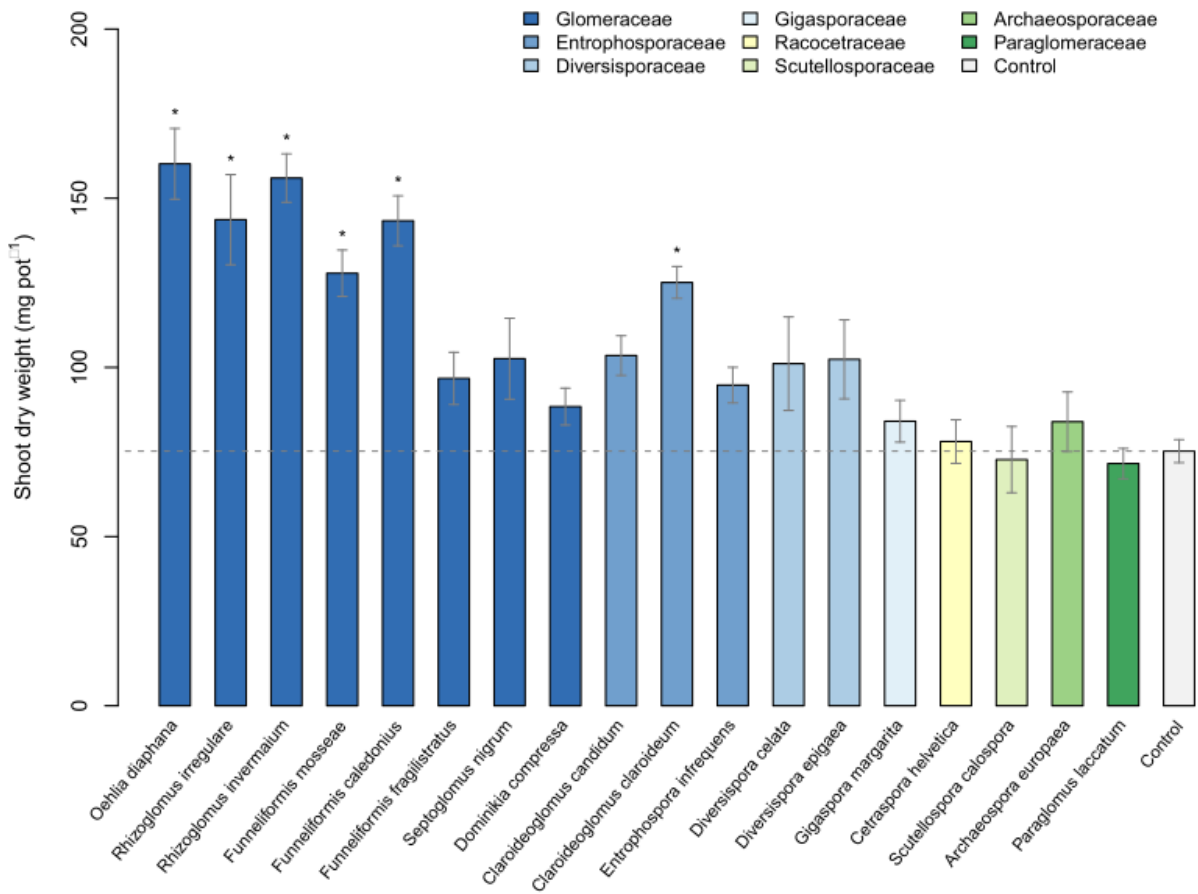
Ancient lineages of arbuscular mycorrhizal fungi provide little plant benefit

### Supplementary Material

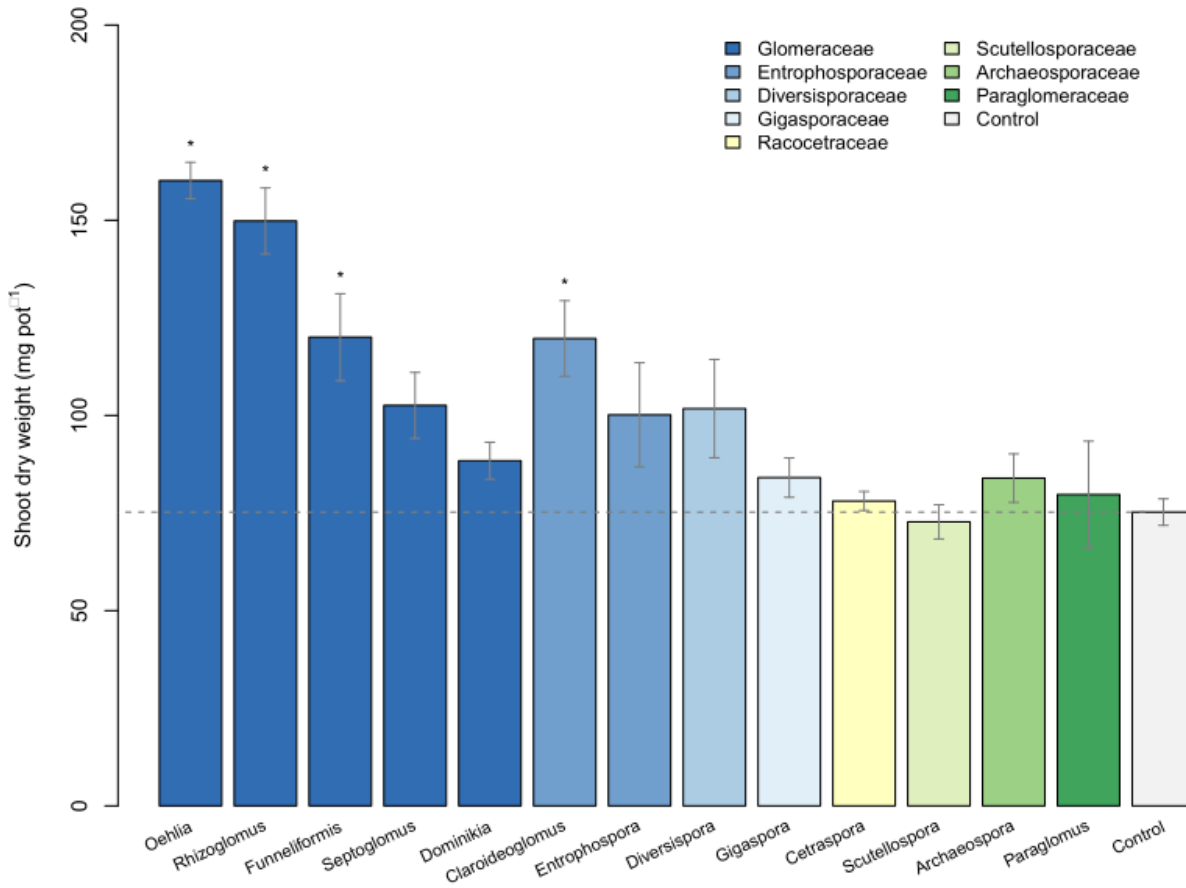
**Fig. S1** Regression analyses for AMF spore numbers of inocula and AMF root colonization of leek plants ( $r^2=0.03$ ).



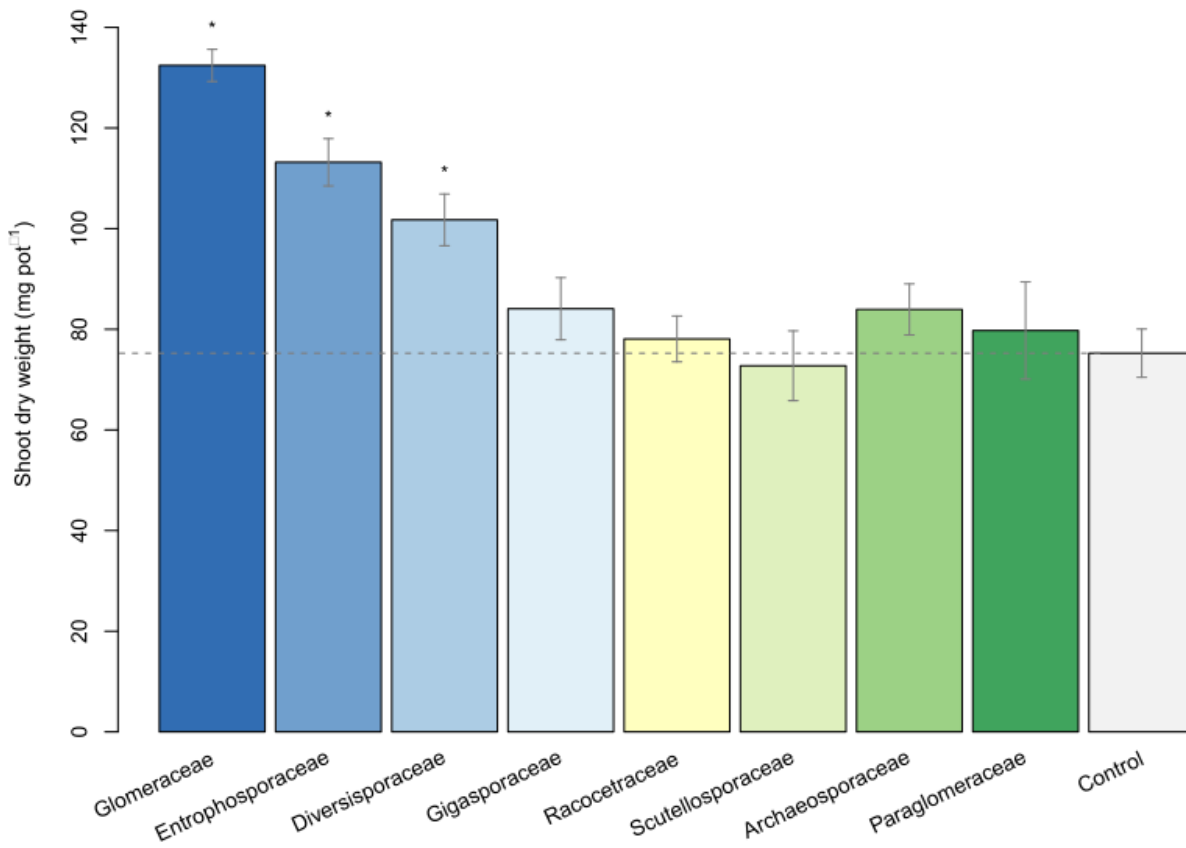
**Fig. S2** Impact of different AMF species on leek biomass. Data are reported as means and their standard error. Significant differences between AMF isolates and the control treatment (bar and dashed horizontal line) are indicated by asterisks and were determined with Dunnett's test ( $p < 0.05$ ) after a one-way ANOVA



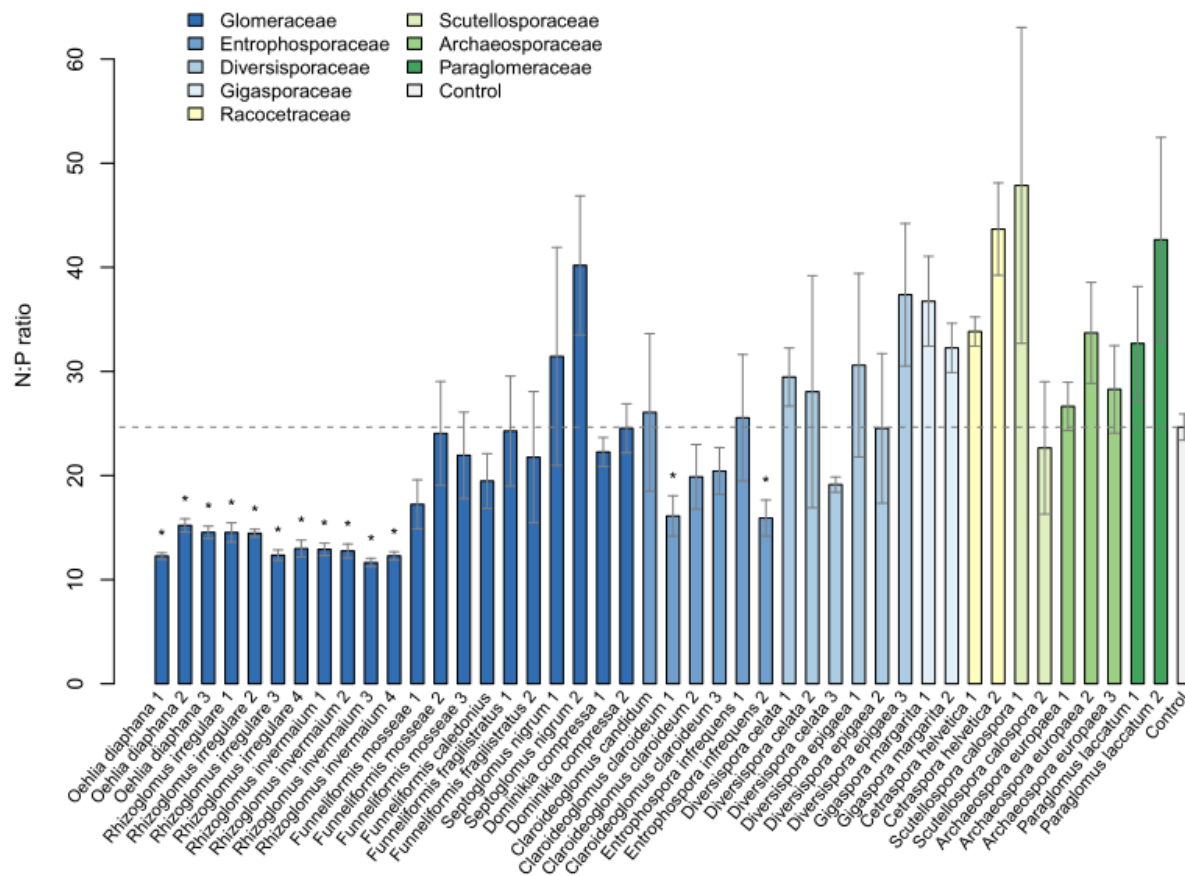
**Fig. S3** Impact of different AMF genera on leek biomass. Data are reported as means and their standard error. Significant differences between AMF isolates and the control treatment (bar and dashed horizontal line) are indicated by asterisks and were determined with Dunn's test ( $p < 0.05$ ) after Kruskal-Wallis test



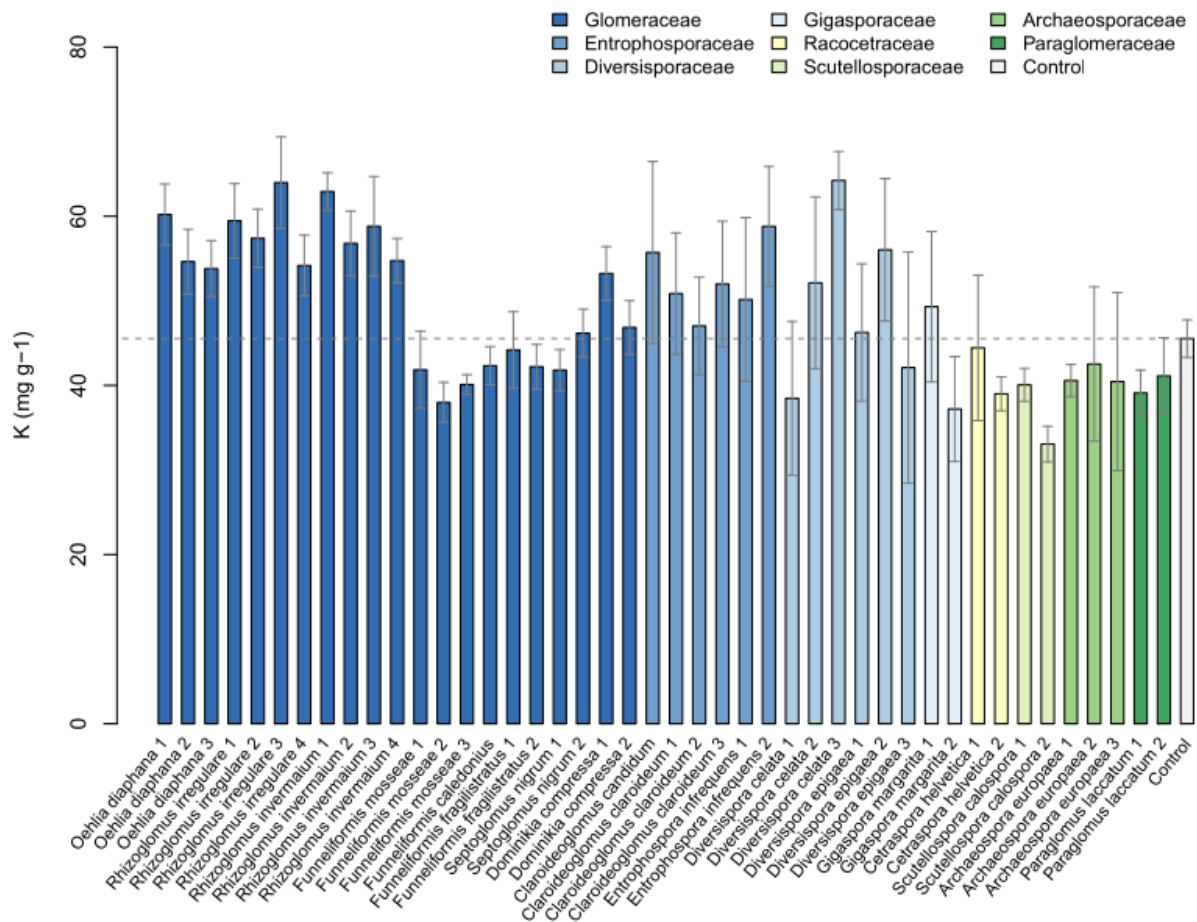
**Fig. S4** Impact of different AMF families on leek biomass. Data are reported as means and their standard error. Significant differences between AMF isolates and the control treatment (bar and dashed horizontal line) are indicated by asterisks and were determined with Dunn's test ( $p < 0.05$ ) after Kruskal-Wallis test.



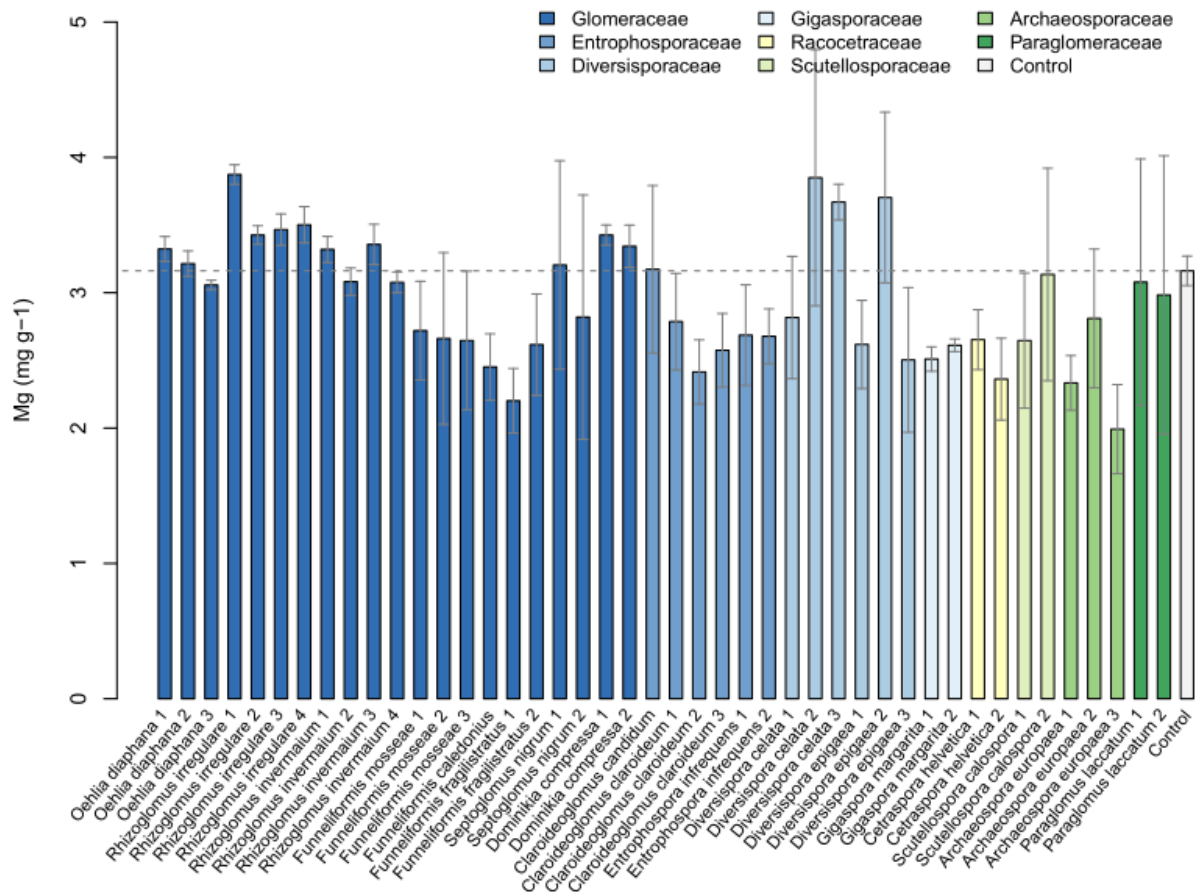
**Fig. S5** N:P ratios in above ground leek biomass inoculated with 44 different AMF isolates and one non-mycorrhizal control. Data are reported as means (n=6) and their standard error. Significant differences between AMF isolates and the control treatment (bar and dashed horizontal line) are determined with Conover's many-to-one test ( $p < 0.05$ ) after the non-parametric Kruskal-Wallis test and indicated by asterisks.



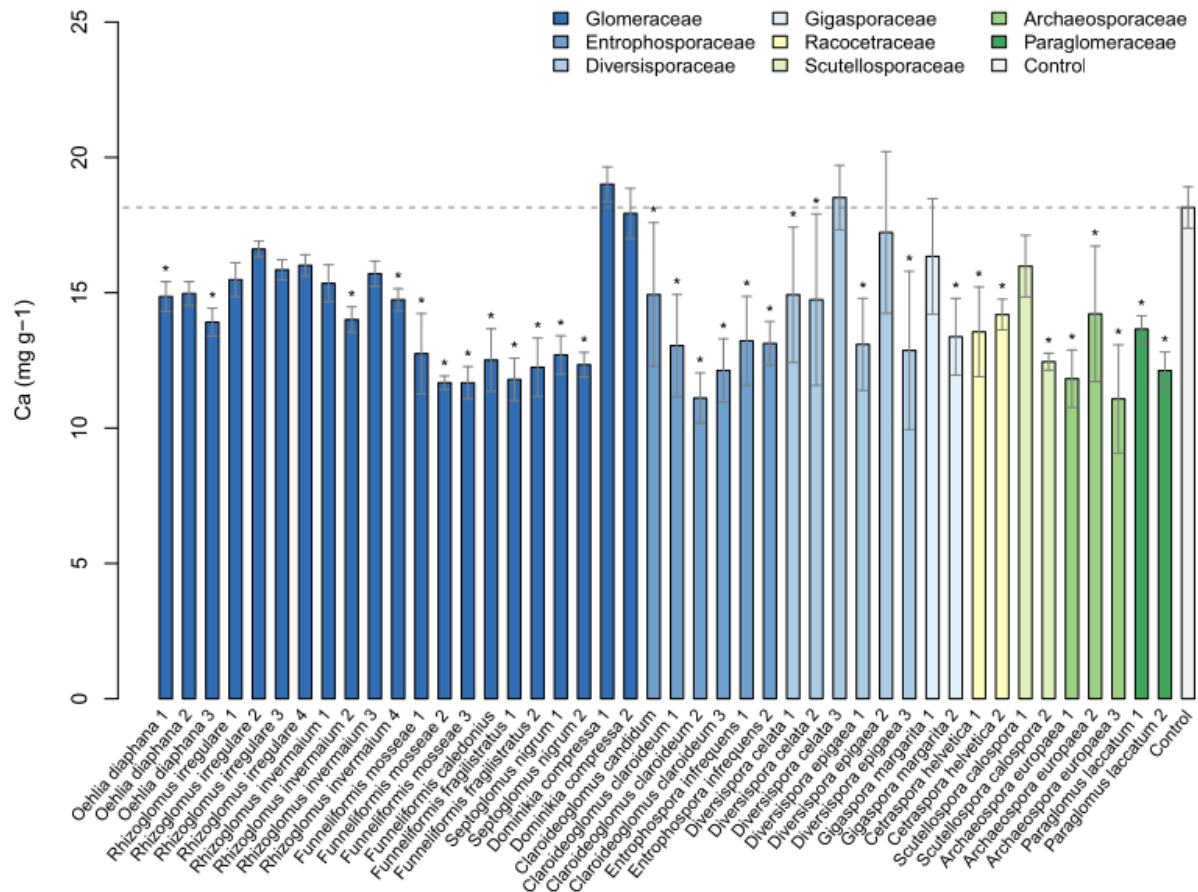
**Fig. S6** Potassium concentration in the shoot biomass inoculated with 44 different AMF isolates and one non-mycorrhizal control. Data are reported as means (n=6) and their standard error. Significant differences between AMF isolates and the control treatment (bar and dashed horizontal line) are determined with Dunn's test ( $p < 0.05$ ) after the non-parametric Kruskal-Wallis test and indicated by asterisks



**Fig. S7** Magnesium concentration in the shoot biomass inoculated with 44 different AMF isolates and one non-mycorrhizal control. Data are reported as means (n=6) and their standard error. Significant differences between AMF isolates and the control treatment (bar and dashed horizontal line) are determined with Dunn's test ( $p < 0.05$ ) after the non-parametric Kruskal-Wallis test and indicated by asterisks



**Fig. S8** Calcium concentration in the shoot biomass inoculated with 44 different AMF isolates and one non-mycorrhizal control. Data are reported as means (n=6) and their standard error. Significant differences between AMF isolates and the control treatment (bar and dashed horizontal line) are determined with Dunn's test ( $p < 0.05$ ) after the non-parametric Kruskal-Wallis test and indicated by asterisks





**Table S1** Total AMF root colonization and presence of vesicles and arbuscules in leek roots (in %) ten weeks after inoculation.

| Isolate | AMF root colonization<br>mean per |         | Vesicles<br>mean per |         | Arbuscules<br>mean per |         |
|---------|-----------------------------------|---------|----------------------|---------|------------------------|---------|
|         | isolate                           | species | isolate              | species | isolate                | species |
| O.dia1  | 85.8*                             | 87.5*   | 15.2*                | 10.7*   | 5.3*                   | 3.8*    |
| O.dia2  | 85.3*                             |         | 5.3*                 |         | 2.3                    |         |
| O.dia3  | 91.5*                             |         | 11.5*                |         | 0.5                    |         |
| R.irr1  | 70.3*                             | 65.6*   | 14.5*                | 7.8*    | 10.8*                  | 9.0*    |
| R.irr2  | 49.2*                             |         | 0.3*                 |         | 5.2*                   |         |
| R.irr3  | 77.7*                             |         | 8.5*                 |         | 11.0*                  |         |
| R.irr4  | 65.0*                             |         | 14.8*                |         | 6.7*                   |         |
| R.inv1  | 44.2*                             | 55.0*   | 7.8*                 | 5.4*    | 5.3*                   | 8.7*    |
| R.inv2  | 64.0*                             |         | 0.4*                 |         | 16.3*                  |         |
| R.inv3  | 78.7*                             |         | 9.3*                 |         | 10.8*                  |         |
| R.inv4  | 42.2*                             |         | 4.2*                 |         | 2.5*                   |         |
| F.mos1  | 40.3*                             | 40.9*   | 0.0                  | 0.1     | 3.0                    | 2.4     |
| F.mos2  | 40.0*                             |         | 0.3                  |         | 1.7                    |         |
| F.mos3  | 42.3*                             |         | 0.0                  |         | 2.5                    |         |
| F.cal   | 33.7*                             | 33.7*   | 0.0                  | 0.0     | 2.8                    | 2.8     |
| F.fra1  | 25.3*                             | 27.4*   | 0.0                  | 0.6     | 2.7                    | 5.0*    |
| F.fra2  | 29.5*                             |         | 1.2                  |         | 7.3                    |         |
| Se.nig1 | 26.3*                             | 26.3*   | 0.2                  | 0.1     | 0.8                    | 0.6     |
| Se.nig2 | 26.3*                             |         | 0.0                  |         | 0.3                    |         |
| Do.com1 | 5.3                               | 3.6     | 0.0                  | 0.0     | 1.0                    | 0.9     |
| Do.com2 | 1.8                               |         | 0.0                  |         | 0.7                    |         |
| Cl.can  | 55.0*                             | 55.0*   | 3.2*                 | 3.2*    | 25.2*                  | 25.2*   |
| Cl.cla1 | 46.2*                             | 54.7*   | 3.9*                 | 4.5*    | 13.5*                  | 10.6*   |
| Cl.cla2 | 71.5*                             |         | 6.2*                 |         | 10.5*                  |         |
| Cl.cla3 | 46.3*                             |         | 3.5*                 |         | 7.7*                   |         |
| E.inf1  | 17.2*                             | 19.5*   | 0.5                  | 0.3     | 0.8                    | 1.4     |
| E.inf2  | 21.8*                             |         | 0.0                  |         | 2.0                    |         |
| Di.cel1 | 0.0                               |         | 0.0                  |         | 0.0                    |         |
| Di.cel2 | 8.2                               | 10.3    | 0.0                  | 0.0     | 0.0                    | 0.0     |
| Di.cel3 | 12.3*                             |         | 0.0                  |         | 0.0                    |         |
| Di.epi1 | 6.2                               | 3.1     | 0.0                  | 0.0     | 0.0                    | 0.0     |
| Di.epi2 | 2.3                               |         | 0.0                  |         | 0.0                    |         |
| Di.epi3 | 0.8                               |         | 0.0                  |         | 0.0                    |         |
| G.mar1  | 16.8*                             | 20.7*   | 0.0                  | 0.0     | 0.0                    | 1.7     |
| G.mar2  | 24.5*                             |         | 0.0                  |         | 3.3                    |         |

|         |     |     |     |     |     |     |
|---------|-----|-----|-----|-----|-----|-----|
| Ce.hel1 | 7.2 | 3.6 | 0.0 | 0.0 | 0.2 | 0.1 |
| Ce.hel2 | 0.0 |     | 0.0 |     | 0.0 |     |
| Sc.cal1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sc.cal2 | 0.0 |     | 0.0 |     | 0.0 |     |
| A.eur1  | 2.2 | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| A.eur2  | 4.5 |     | 0.0 |     | 0.0 |     |
| A.eur3  | 0.8 |     | 0.0 |     | 0.0 |     |
| P.lac1  | 4.7 | 2.4 | 0.5 | 0.3 | 0.0 | 0.0 |
| P.lac2  | 0.0 |     | 0.0 |     | 0.0 |     |
| Control | 0.0 |     | 0.0 | 0.0 | 0.0 | 0.0 |

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\*significant at  $p < 0.05$  determined by Fischer's LSD-test

**Table S2** REML analyses for the effect of AMF species and AMF isolates within species on leek biomass.

| Variable                | Sum of squares | d. f. | F-value | p-value     |
|-------------------------|----------------|-------|---------|-------------|
| (Intercept)             | 43 861         | 1     | 62.04   | < 0.0001*** |
| Species                 | 73 319         | 14    | 7.41    | < 0.0001*** |
| Isolates within species | 10 579         | 23    | 1.15    | 0.322       |
| Residuals               | 98 979         | 140   |         |             |