SUPPLEMENTAL DATA

Figure 1. Identification of miR399-guided cleavage products. RNA duplexes between miR399f and 4 of 5 target sites (sites 2-5) on *PHO2* mRNAs are shown. Numbers indicate the fraction of cloned PCR products terminating at a given position. Results from the rootstocks of 399f/wt plants (red numbers), *pho1* mutant (blue numbers) and roots of Pi-starved wild-type plants (black numbers) are indicated. Mapping of cleavage sites was performed by the analysis of RNA ligase-mediated 5' rapid amplification of cDNA end (RLM-5' RACE). The 5' end of most mRNA fragments is mapped to the nucleotide that pairs to the 10th nucleotide of the miR399s.

Figure 2. Pi concentration in the scions of reciprocal grafts between wild-type and miR399c-overexpressing Arabidopsis plants. Each spot represents one data point from an independent grafted plant.

Figure 3. Pi toxicity phenotype (A) and shoot Pi concentration (B) in transgenic tobacco plants overexpressing Arabidopsis miR399b or miR39f compared to wild-type tobacco plants. C, The sequence alignment among Arabidopsis miR399s and four potential target sites on the tobacco *PHO2* mRNA. Bar = 5 cm in A.

Figure 4. A, Processing efficiency of miR171b in shoots and roots of wild-type plants grown under Pi-sufficient (+Pi) or -deficient (-Pi) conditions. The processing efficiency is indicated as a ratio of mature miR171b to pri-miR171b. B, Promoter activities of miR399a, b, c or f in shoots versus in roots. The promoter activity is presented as the abundance of er*GFP* mRNA driven by the miR399 promoter. Two independent transgenic lines are shown for each promoter.

Figure 5. Specificity of TaqMan® miRNA assays among different miR399 species. Relative detection (%) is calculated on the basis of the C_T difference between perfectly matched and mismatched synthetic miRNAs. A total of 2×10^7 copies of synthetic RNA, which represents the physiological concentrations of miR399s was added to each TaqMan® reaction. Sequences of miR399 species are shown and nucleotides different from others are highlighted.