

Figure 1: Geographic and geological setting of the Nahr Ibrahim watershed. The bold blue line represents the Nahr Ibrahim River. The yellow diamonds indicate the location of sampling sites. The Red triangle represents the Akoura meteorological station. The river profile is given below the geological map.

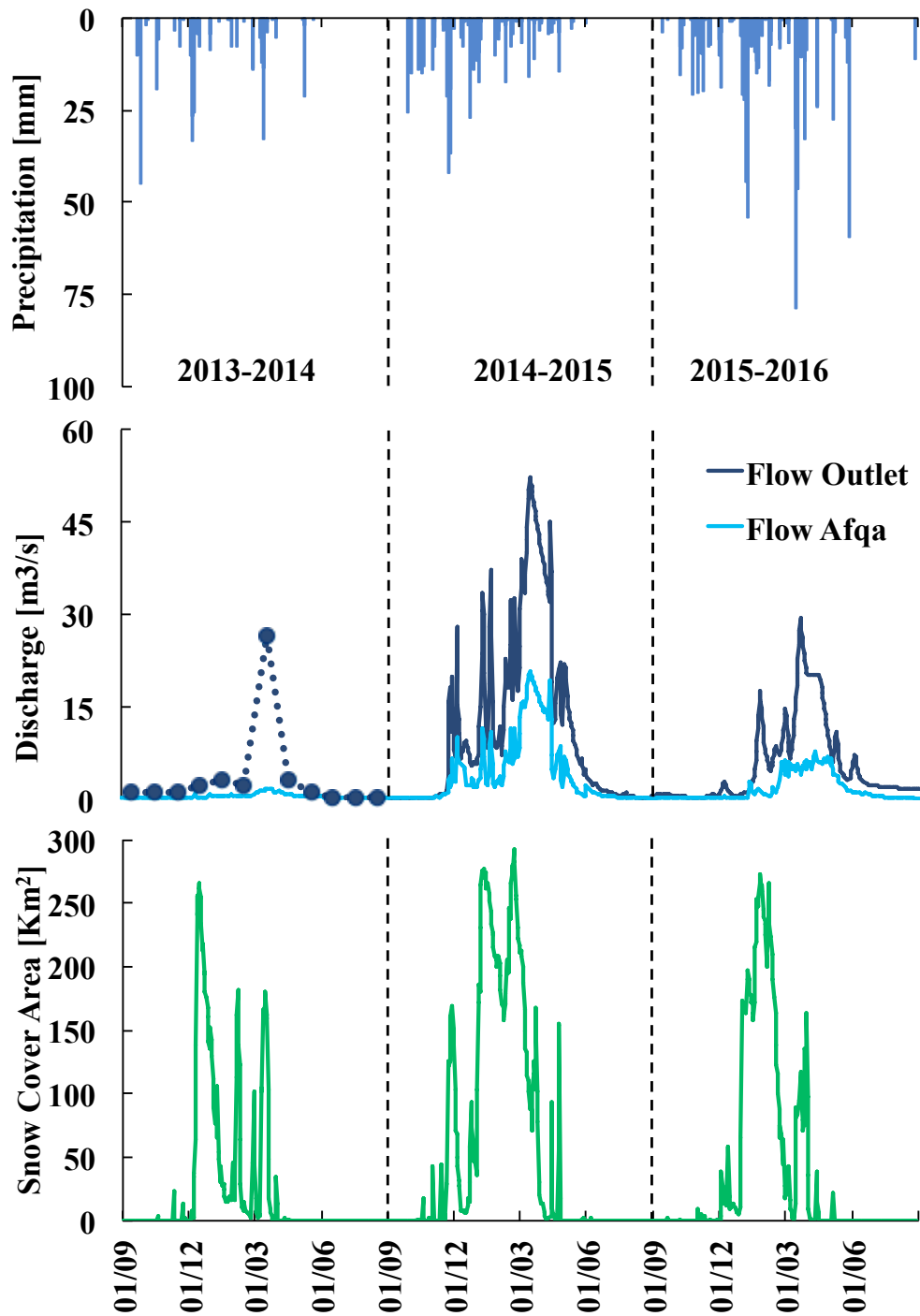


Figure 2: (a) Precipitation at Akoura Meteorological station. (b) Nahr Ibrahim discharge at Afqa gauging station and at Outlet. (c) Snow cover area in the Nahr Ibrahim watershed.

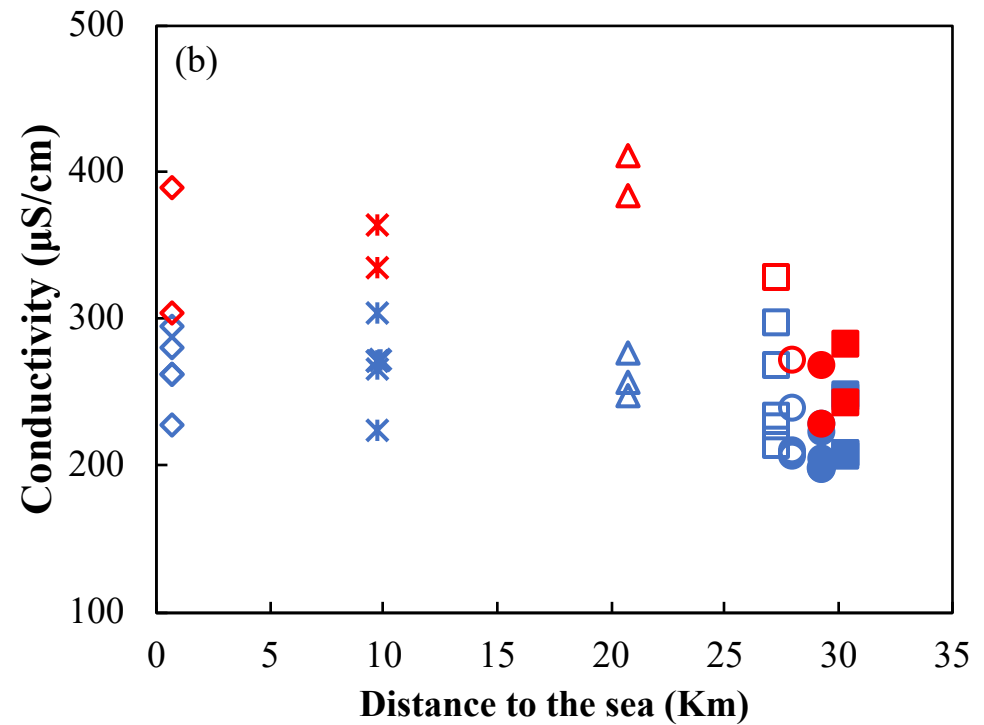
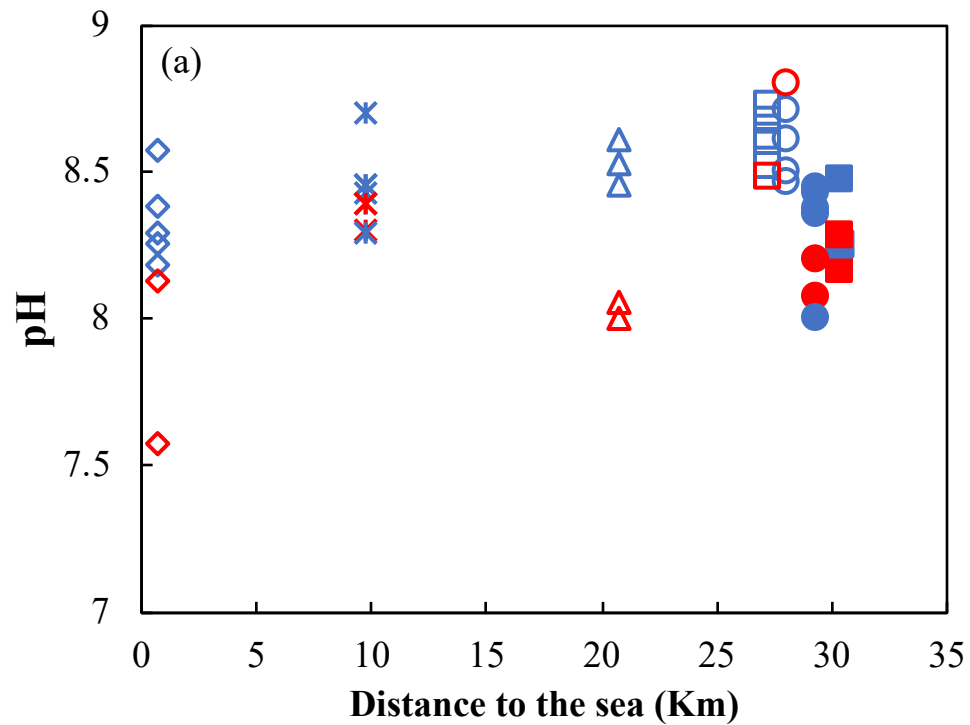


Figure 3: (a) pH and (b) electrical conductivity measurements at different sampling sites. ● Afqa; ■ Roueiss; □ Yenouh; ○ Mzarib; △ Janneh; * Yahshoush; ◇ Outlet. Samples collected during the wet season in blue, during the dry season in red.

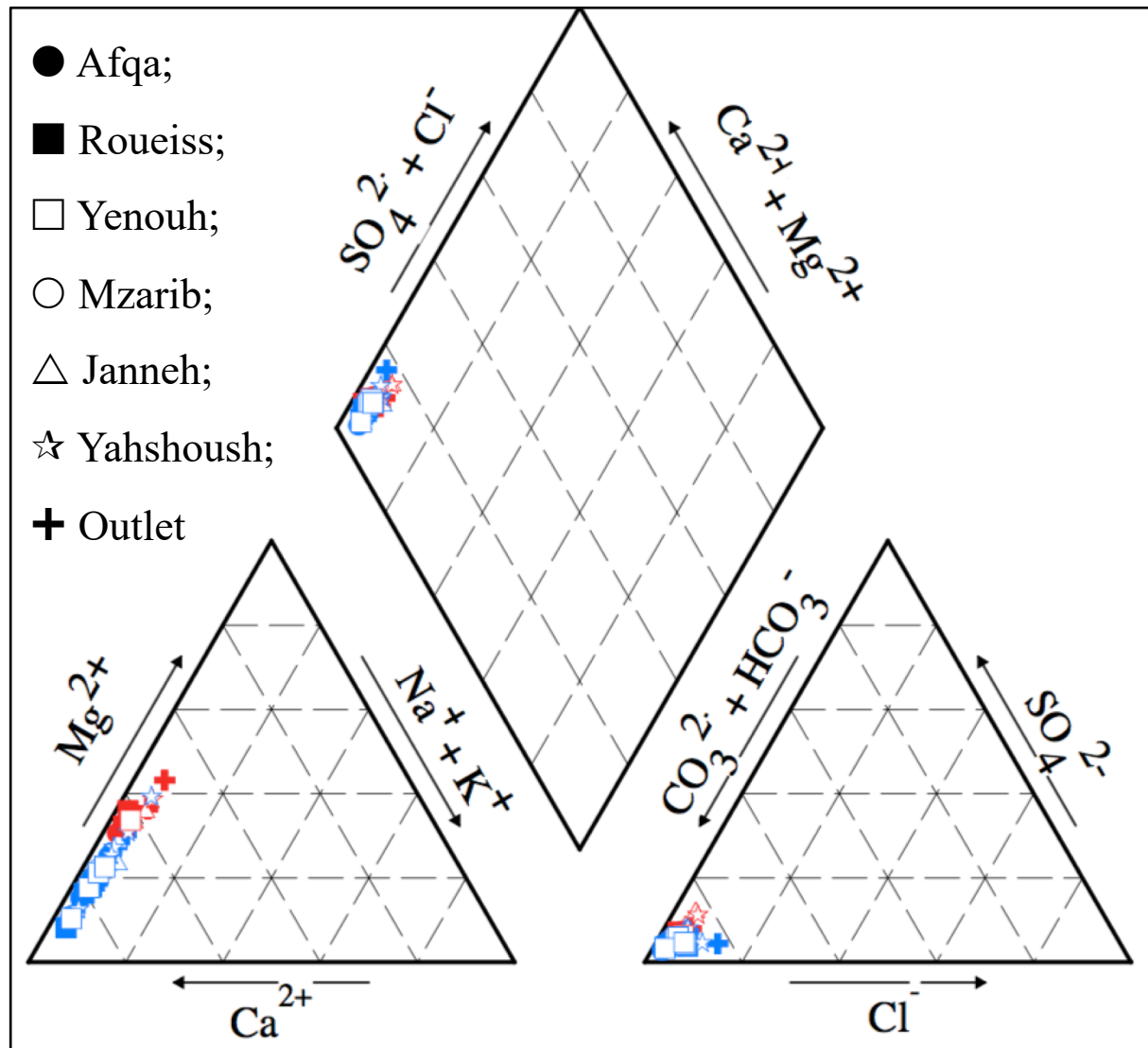


Figure 4: Piper trilinear diagram for the Nahr Ibrahim water samples. Wet season samples are in blue, dry season samples are in red. (☆ corresponds to * in the other graphs, and + corresponds to ◇)

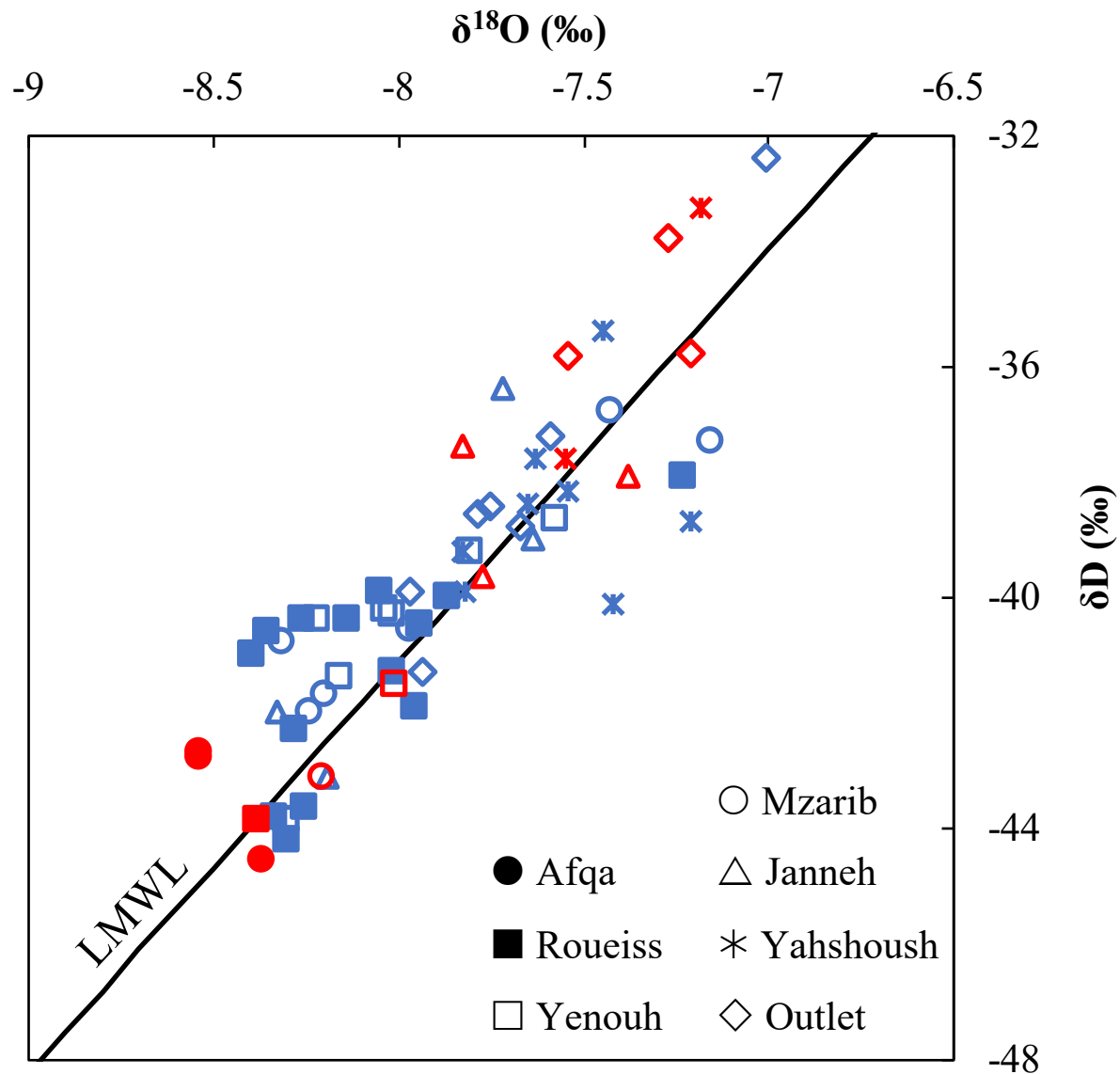


Figure 5: Plot of $\delta^{18}\text{O}$ vs. δD for the Nahr Ibrahim water samples. Samples taken during the wet season are in blue, whereas samples taken during dry season are in red. The solid line shows the Lebanese Meteoric Water Line ($\delta\text{D}=7.135*\delta^{18}\text{O}+15.979$).

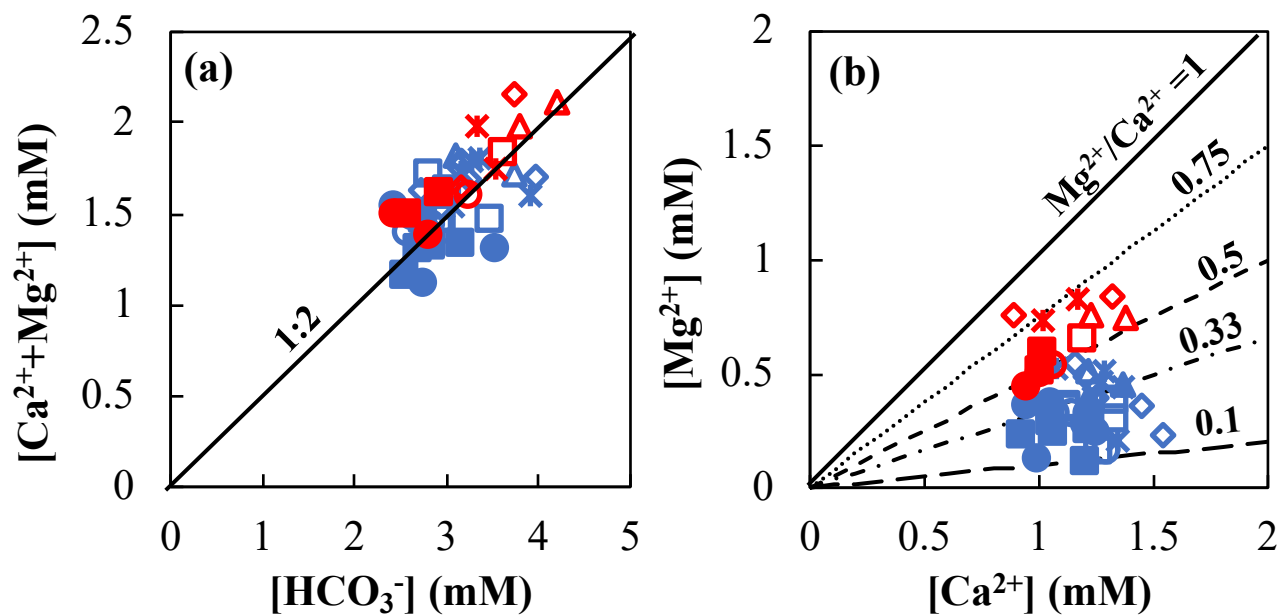


Figure 6: (a) Plot of $\text{Ca}^{2+} + \text{Mg}^{2+}$ versus HCO_3^- for the Nahr Ibrahim watershed. The solid line shows the $(\text{Ca}^{2+} + \text{Mg}^{2+}) : 2\text{HCO}_3^-$ relationship. (b) Mg^{2+} versus Ca^{2+} for the Nahr Ibrahim watershed. The solid lines show various $\text{Mg}^{2+}/\text{Ca}^{2+}$ ratios that characterize dolomite and/or calcite dissolution. ● Afqa; ■ Roueiss; □ Yenouh; ○ Mzarib; △ Janneh; * Yahshoush; ◇ Outlet. Wet season samples are in blue, dry season samples are in red.

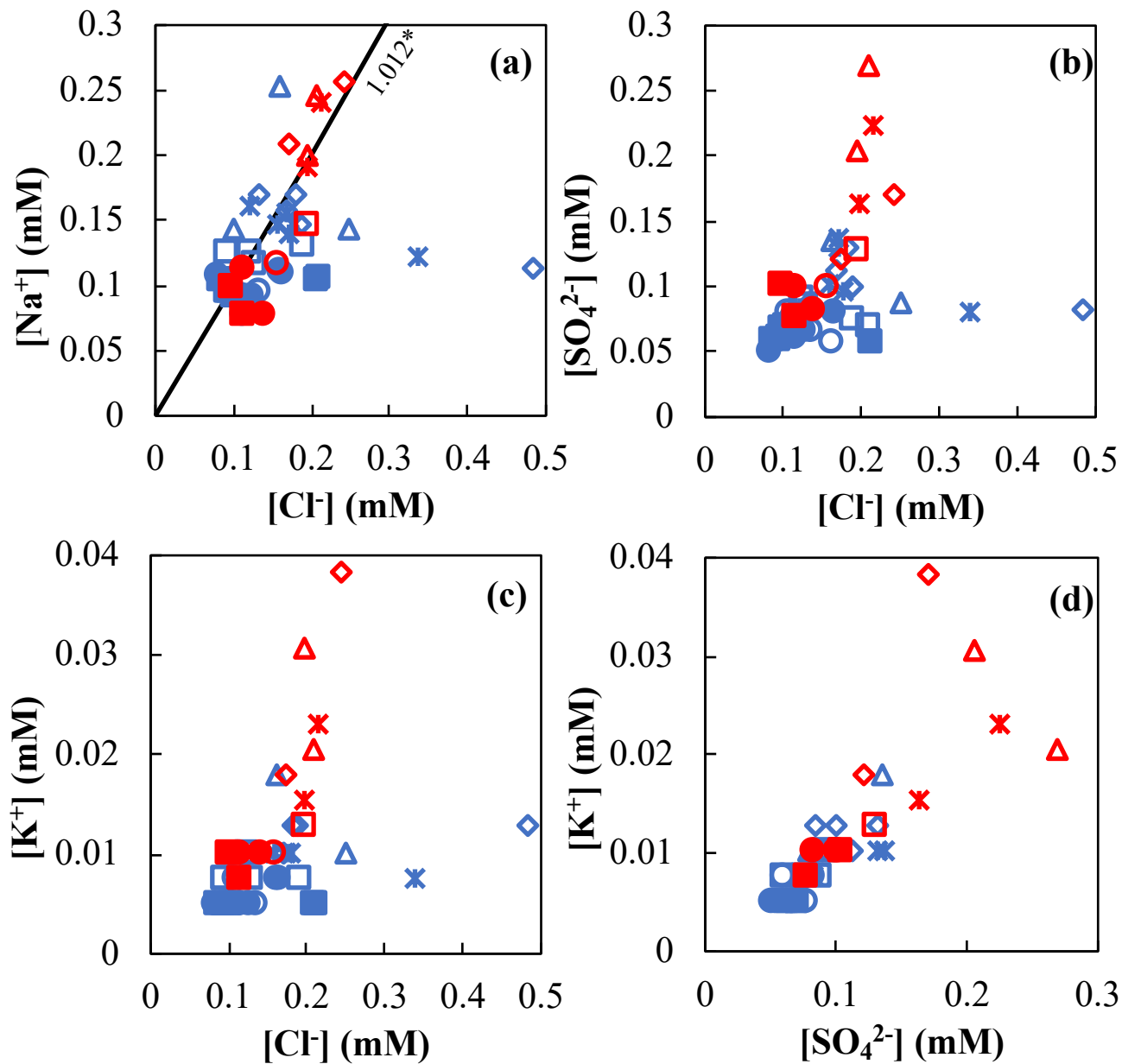


Figure 7: (a) Plot of Na^+ versus Cl^- . The solid line shows the Na^+/Cl^- ratio in local precipitations (Saad et al., 2000). (b) Plot of SO_4^{2-} versus Cl^- . (c) Plot of K^+ versus Cl^- . (d) Plot of K^+ versus SO_4^{2-} . ● Afqa; ■ Roueiss; □ Yenouh; ○ Mzarib; △ Janneh; * Yahshoush; ◇ Outlet. Samples collected during the wet season are in blue, samples collected during the dry season are in red.

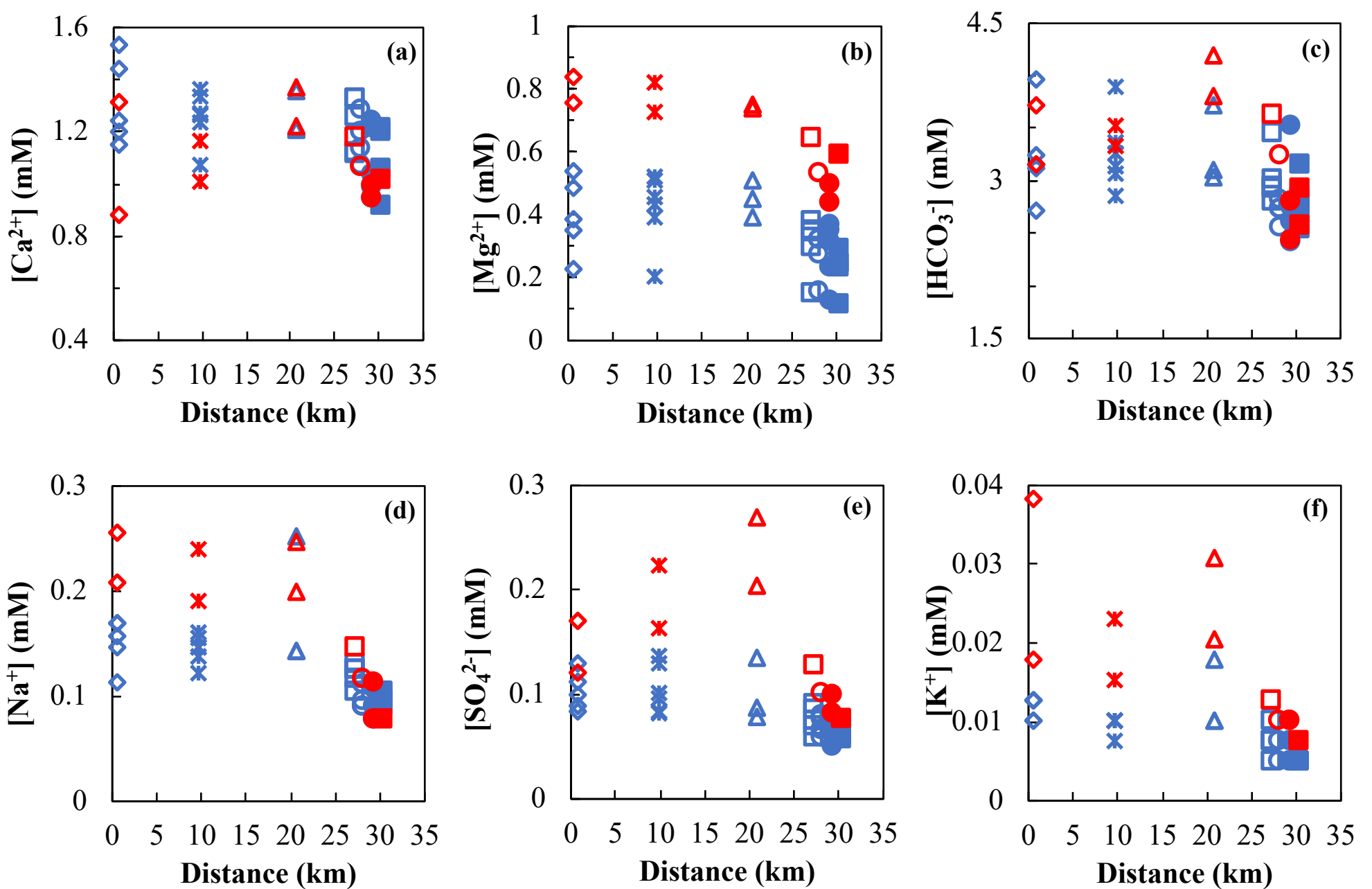


Figure 8: Downstream evolution of (a) Ca^{2+} ; (b) Mg^{2+} ; (c) HCO_3^- (d) Na^+ ; (e) SO_4^{2-} and (f) K^+ . The distance is from the outlet of the Nahr Ibrahim River in the Mediterranean sea. ● Afqa; ■ Roueiss; □ Yenouh; ○ Mzarib; △ Janneh; * Yahshoush; ◇ Outlet. Wet season samples are in blue, dry season samples are in red.

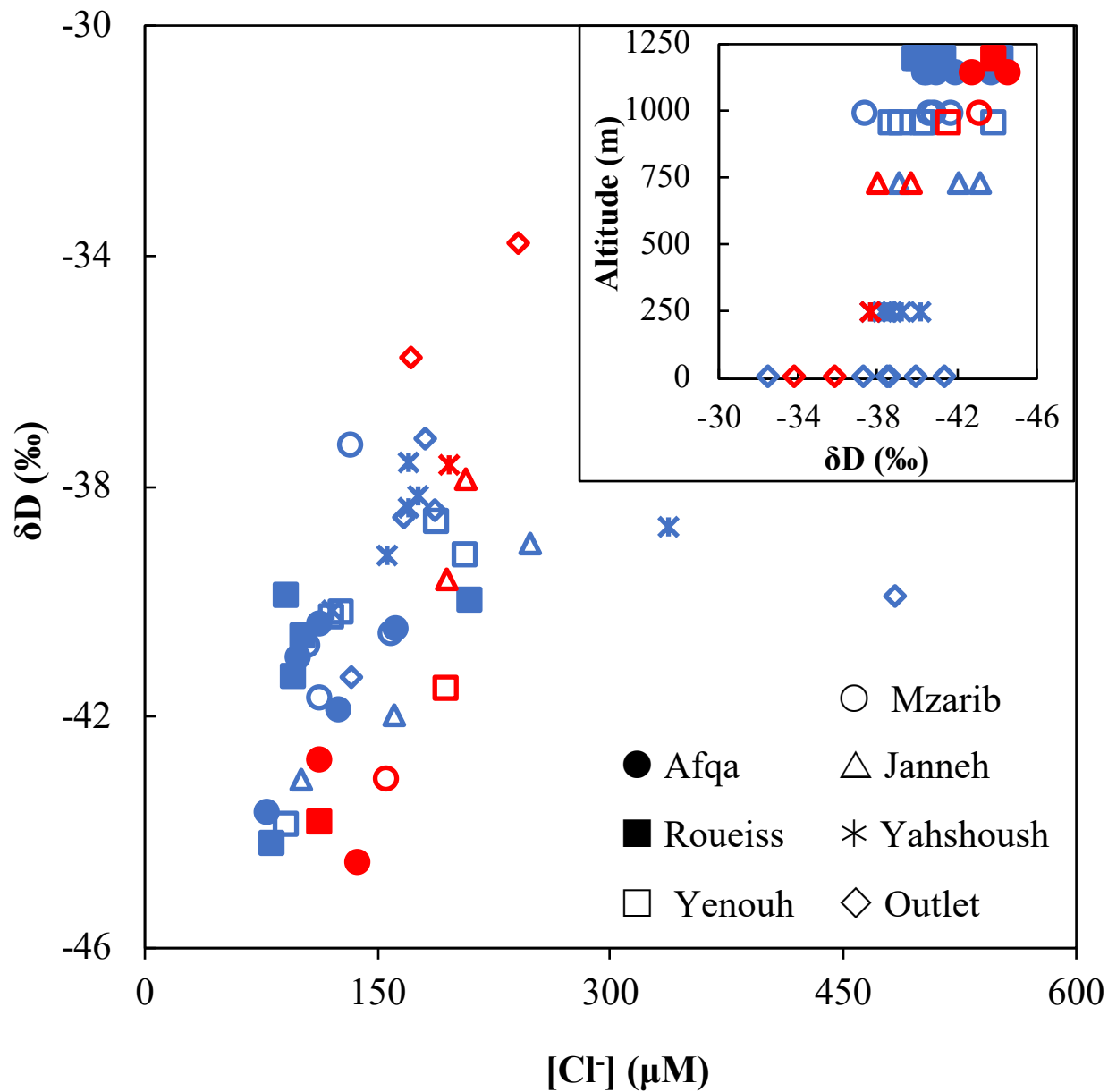


Figure 9: Plot of δD versus Cl^- for the Nahr Ibrahim water samples. The inset gives the variation of δD with the altitude of the sampling site. Wet season samples are in blue, dry season samples are in red.

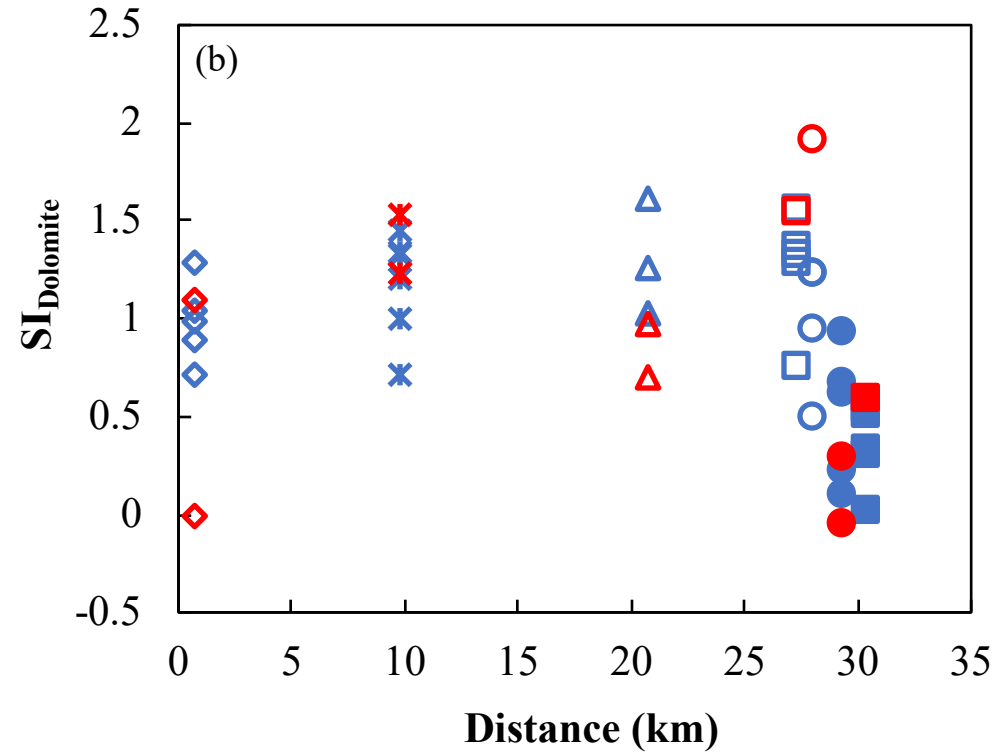
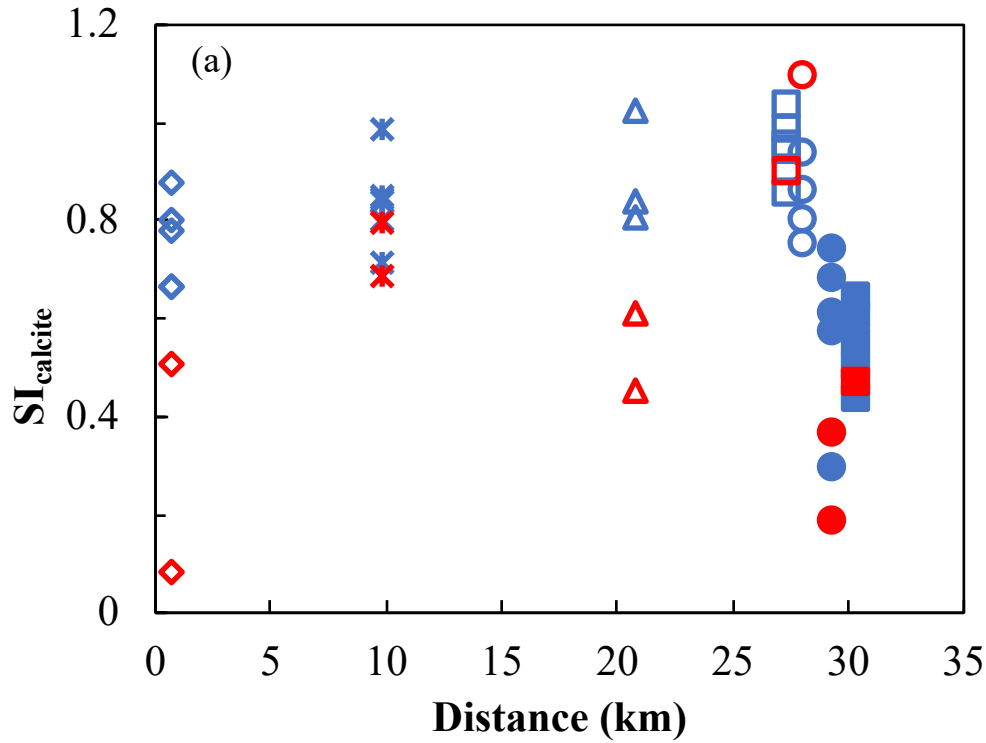


Figure 10: Downstream evolution of (a) calcite saturation index SI_{Calcite} and (b) dolomite saturation index SI_{Dolomite} for the Nahr Ibrahim water samples. ● Afqa; ■ Roueiss; □ Yenouh; ○ Mzarib; △ Janneh; * Yahshoush; ◇ Outlet. Wet season samples are in blue, dry season samples are in red.