Pisidia Antiocheia located north of the Yalvac district in the Isparta province in southwestern Anatolia has a historical significance for Christianity. St. Paulus (St. Paul) and Barnabas being the greatest contributors for the initial spread of Christianity came to Pisidia Antiocheia early in their first missionary journey. There, they were invited to speak to the congregation in a synagogue. This sermon is known as one of St. Paul's first speeches as a missioner. Today, St. Paul Church – the first big church of the ancient city – is still available. However, there is no sign of the synagogue, where he made his first speech in the Pisidia Antiocheia. Integrated electrical resistivity tomography (ERT) and ground-penetrating radar (GPR) surveys were carried out at the site to investigate this synagogue under of the church. The ERT studies were performed along 16 profiles in the directions of N–S and E–W using Wenner–Schlumberger array. GPR method was applied along 110 profiles spaced by 0.5 m and coincident with N-S trending ERT profiles. The integrated interpretation of the obtained results indicates some anomalies most probably belonging to remains of this historical synagogue.