In the present study, the chemical composition and the antifungal properties against Saprolegnia parasitica (in vitro and in vivo) of the essential oils of thyme (Satureja cuneifolia) from Mediterranean region of Turkey were evaluated for the first time. The composition of oils was analysed using gas chromatography/mass spectrometry (GC/MS). The major constituents of oil of S. cuneifolia were cavracrol (46.84%) and cymene (16.90%). Antifungal effects of S. cuneifolia essential oil against S. parasitica strains (A1 and E1) were detected by disc diffusion and tube dilution assays. The antifungal effect of S. cuneifolia was determined to be stronger against S. parasitica E1 isolate (MIC 50μL/ml, MLC 250 μL/ml) compared with S. parasitica A1 isolate (MIC 50 μL/ml, MLC 500 μL/ml). Following in vitro assays, effective doses of S. cuneifolia for disease control in rainbow trout eggs experimentally infected with S. parasitica were investigated. For this aim, infected eggs were treated with the essential oil (0, 5, 10, 20 and 50 ppm) during incubation period (21 days) after fertilization. Formalin (5 ml/L) was used as positive control. Hatching rate of eggs at the end of incubation period were calculated. The highest hatching rates were recorded in S. parasitica E1 strain at 5 and 10 ppm concentrations of S. cuneifolia and in S. parasitica A1 strain at 10 and 20 ppm (P < 0.05).