Study on the effect of some medicinal plants essential oils on non-specific immune system of sterlet (*Acipenser ruthenus*)

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Abstract
The current study was done with the aim of evaluating the effects of the essential oils extracted from *Mentha longifolia*, *Satureja hortensis*, *Zataria multiflora* on some hematological parameters in sterlet fish (*Acipenser ruthenus*). The essential oils were added to daily diet (1%) for one month and cellular and humoral immunity parameters were studied at the end of the experiment. The results indicated that the percent of neutrophils has been increased in test groups, especially for *Zataria multiflora* and *Mentha longifolia*, compared to the control group ($P \leq 0.05$), however no significant difference was observed for leukocytes among different groups. Number of phagocytic bacteria in test groups was also higher than the control group ($P < 0.05$). The results also indicated an increase in lysozyme level in test groups with a statistical difference between the fish fed by *Satureja hortensis* and control group ($P \leq 0.05$). Principally, the results represented the increase of some cellular and humoral immune parameters of starlet following administration of the essential oil of the above-mentioned plants; accordingly using the studied essential oils especially *Satureja hortensis* and *Zataria multiflora* for this fish species is recommended.

Keywords: *Acipenser ruthenus*, Immune system, Medicinal plants.