Studies on the role of some natural products on the biology physiology and silk secretion of silkworm bombyx mori

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The present study had been carried out to compare the results of rearing silkworm Bombyx mori L. (Chull Thi No.1) fed on mulberry leaves with some nutritional additives, three plant oils extracted by steam distillation from either the leaves of lime (Citrus ourantifdia), clove (Eugenia caryophyllus) and jojoba (Simmondsi chinensi) oil. The treatments were used two times only in the first and the middle of the 4th and 5th instars, these treatments were used on 3 concentrations both in spring seasons of 2007 and 2008. The present work constituted three types of investigations on each treatment; biological, technological and physiological studies. 1-Biological studies:Larval mortality:The mortality percentages of the fourth instar fed on mulberry leaves supplemented with lime, clove and jojoba oils with 3 concentrations (0.5, 1.0 and 2.0 %) for each treatment were recorded. In seasons 2007 & 2008 lime oil exhibited the least percent mortality in 4th & 5th larval instar, followed by clove oil, then jojoba oil, while control group recorded the highest mortality.Larval duration:Means of duration period of fourth larval as response to extracted oils and its concentrations, all treatments showed higher results than control. In season 2007, lime oil exhibited the shortest duration period in 4th & 5th larval instar, followed byclove oil while jojoba oil and control group recorded the highest duration period then in season 2008 lime oil exhibited the shortest duration period, followed by clove oil, then jojoba oil, while control group recorded the highest duration period.Cocooning percentage.:The mean of cocooning percentage in seasons 2007& 2008 as response to extracted oils and its concentrations showed that, all treatments showed higher results than control. Lime oil exhibited the highest cocooning percentage, followed by clove oil then jojoba oil, while control group recorded the least cocooning percentage.Adult emergence:Results showed the mean of adult emergence in seasons 2007& 2008 as response to extracted oils and its concentrations, all treatments showed higher results than control. Lime oil gave the highest adult emergence, followed by clove oil then jojoba oil, while control group recorded the least result.Fecundity (eggs/ female):Results showed the mean of the number of eggs deposited per one female in seasons 2007& 2008 as response to the extracted oils and its concentrations, all treatments showed good results than control. Lime oil gave the highest number of deposited eggs/moth, fbllowed by clove oil, then jojoba oil, while control group recorded the least number of deposited eggs/female.2-Technological results:1-Cocoon indices:Weight of fresh cocoon.Results revealed that the mean of weight fresh cocoon in season 2007 as response to the extracted oils and its concentrations. Some treatments showed higher results than control, lime oil exhibited the highest weight of fresh cocoon, followed by clove oil then the control group, while jojoba oil exhibited the least weight of fresh cocoon. But in season 2008 lime oil recorded the highest weight of fresh cocoon followed by clove oil, after that the control group, while jojoba oil recorded the least weight of fresh cocoon.Cocoon shell weight:The mean of cocoon shell weights in seasons 2007& 2008 as response to the extracted oils and its concentrations showed that, all treatments exhibited higher results than control. Lime oil recorded the highest weight of cocoon shell, followed by clove oil then jojoba oil, while control group recorded the least weightof cocoon shell.Silk content %:The means of silk content ratio of fresh cocoon in season 2007 as response to extracted oils and its concentrations exhibited all treatments showed

higher results than control; lime oil recorded the highest ratio of silk content, followed by jojoba oil then clove oil, while control group gave the least ratio of silk content. But in season 2008, lime oil exhibited the highest ratioof silk content, followed by clove oil, then jojoba oil, while control group exhibited the least ratio of silk content.2-Reeled silk filament parameters: Length of reeled filament (m):Results showed that the means of length of reeled silk filament in seasons 2007& 2008 as response to extracted oils and its concentrations exhibited all treatments showed higher results than control; lime oil recorded the highest length of reeled silk filament, followed by clove oil, then jojoba oil, while control group exhibited the least length of reeled silk filament.Weight of silk filament:These means of weight of silk filament in seasons 2007& 2008 as response to exit-acted oils and its concentrations showed that all treatments exhibited higher results than control, lime oil recorded the highest weight of silk filament, followed by clove oil and then jojoba oil, while control group exhibited the least weight of silk filament.Size of silk filament:The means of size of reeled silk filament in seasons 2007& 2008 as response to extracted oils and its concentrations showed that all treatments exhibited higher results than control, lime oil recorded the highest size of reeled silk filament, followed by clove oil and then jojoba oil, while control group exhibited the least size of reeled silk filament.3-Physiological studies:1-Determining the activities of glutamic oxaloacetic transaminase (GOT) and glutamic pyruvic transaminase (GPT) enzymes in haemolymph:GPT activity:Results cleared the mean activity of GPT enzyme in the larval haemolymph fed on mulberry leaves supplemented with 3 extracted oils of lime, clove and jojoba and its concentrations in season 2007. Some treatments showed higher results than control, lime oil exhibited the highest activity of GPT, followed by the control group, and then clove oil, while jojoba oil recorded the least activity of GPT. On the other hand in season 2008 lime oil exhibited the highest activity of GPT, followed by the control group and then jojoba oil, while clove oil recorded the least activity of GPT.GOT activity:The mean activity of GOT enzyme in season 2007 as responses to extracted oils and its concentrations showed that all treatments exhibited higher results than control, clove oil recorded the highest activity of GOT, followed by lime oil and then jojoba oil, while control group recorded the least activity of GOT. But in season 2008 lime oil exhibited the highest activity of GOT, followed by clove oil and the control group, while jojoba oil recorded the least activity of GOT.2- Soluble protein content in larval haemolymph:The mean soluble protein content in larval haemolymph in season 2007 as responses to extracted oils and its concentrationsexhibited some treatments showed higher results than control such as lime oil recorded the highest soluble protein content in larval haemolymph, followed by clove oil and jojoba oil, while control group exhibited the least soluble protein content in the haemolymph. But in season 2008, lime and clove oils recorded the highest soluble protein content in larval haemolymph, followed by jojoba oil, while control group recorded the least soluble protein content in the haemolymph.According to the overall results of this study, it could be concluded that, use of the three plants extracted oils, lime, clove and jojoba oil with three concentrations (0.5, 1.0 and 2.0%) could have great benefit as nutritional additives for rearing silkworm Bombyx mori L.