SUMMARY

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Biological and Behavioural studies on certain Scarabaeids of Agricultural Importance in Egypt

The present work has came as a continuity of a previous study on the peach cockchafer ***Pachnoda fasciata*** (Kamel 1988). The present study is concerned with some behavioural studies on two scarabaeids of economic importance in Egypt, ***i-e*** the hairy rose beetle ***Tropinota squalida*** Scop. and ***Pachnoda fasciata*** F.. Results of laboratory and field studies demonstrated that there are some similarities between the behaviour of the two species. Each of the two species has one generation a year (univoltine insect). The adults of both of them are diurnal, becoming active during the day, especially in sunny weather and mating takes place on branches of the favourable fruits and ornamental trees. Yet, no copula was observed during the flight. Females of ***T. squalida*** and ***P. fasciata*** lay their eggs in the soil, where the hatched larvae construct their tunnels.

Females of ***T. squalida*** showed different degrees of preference to different soil mixtures as oviposition media; it was found that a soil mixture composed of clay, cattle dung, peatmoss and sand in equal proportion, was the most attractive one where more eggs were laid by the female. In addition, females of ***T.***

squalida produced larger number of eggs when fed on banana, followed by green bean flowers, mollasses, cauliflowr, concentrated and diluted honey, descendingly. The 3rd instar larvae of *T. squalida* make tunneles at depths ranging between 6 and 34 cm from the soil surface. At the end of the larval stage, the fullqrown larvae construct earthen cocoons by semicircular repeated movements of the caudal end of the abdomen, soil particles are plastered with gut contents discharged through regurgitation. Within this earthen cell the larva turns into pupa.

T. squalida larvae were reared in different soil mixtures to examine the best soil composition as rearing media. It was found that a soil composed of clay, cattle dung, peatmoss and sand is the best one. In this medium larvae underwent the last larval period (19.6 $\pm$ 2.48 days) in comparison with the other tested mixtures.

Both *P. fasciata* and *T. squalida* larvae were reared in soil containing different germinating seeds, *i-e* barley, clover, white maize and beans in case of **P. fasciata** and barley, clover, white maize, grass and beans in case of **T. squalida**. It was found that larval weight was more increased when reared in soil containing barley than in other treatments in both species.

In addition, the two species were exposed to different coloured lights (white, blue, green, yellow and red). It was found that the beetles were attracted to white light, followed by blue, green, yellow and red, respectively.

By feeding the adults of the two species on four naturally occurring sugars *i-e* (glucose, fructose, sucrose and maltose). Sucrose was found to attract higher number of adults, and a concentration of 0.5 m sucrose seemed to be the most attractive to the two scarabaeids under investigations. However, all the tested sugars were not strong feeding attractants to the beetles of the two species under investigations.

Two scarabaeids were reared under different constant temperature *i-e* the 9°C, 20°C, 30°C as well as at room temperature. It was found that in case of ***T. squalida*** no hatchability was recorded for eggs kept at 9°C indicating this degree was too low for the embryonic development; also the same thermal degree was very damaging to the 1st and 2nd instar-larvae of ***T. squalida*** and the 3rd instar-larvae of ***P. fasciata.***

Thus, keeping ***T. squalida*** eggs or larvae or the 3rd instar-larve of ***P. fasciata*** at such low temperature for regulating the laboratory culture is not feasible. However, at 20°C egg hatchability was moderate and the same could be said for the 1st and 2nd larval instar of ***T. squalida***. In case of the 3rd larval instar of ***P. fasciata*** the duration period extended at 20°C (247.04 $\pm$ 16.5 days) compared to that of room temperature (192.2 $\pm$ 5.1 days). On the other hand, at 30°C ***T. squalida*** eggs started to hatch on the 3rd day while the remaining eggs hatched on the 7th day *i-e* the incubation period was shorter at higher temperature

(30°C) than at low temperature. In addition, the duration periods of the 1st, 2nd larval instar of **T. squalida**, 3rd larval instar and pupae of ***P. fasciata*** were shorter at 30°C than at other tested temperature. At this degree the eggs were healthy and the larvae well developed, active, fed normally and their weight increased and moulted quickly.

In respect to the dult behaviour the number of males and females of ***T. squalida*** entering the soil and the time they spent inside it under semifield conditions were examined. It was found that the beetles resort to the soil to escape hot weather, when the temperature was 17.3°C ± 2.02°C ranged between 10 and 25°C and the air temperature increased (25°C) the mean number of females entered the soil from 9 AM-16 PM. 2.96 ± 1.5 and the mean time they spent was 120.7 ± 29.1 min. While the mean number of hidden males at the same time was 1.4 ± 0.5 insects and the mean time they spent was 34.1 ± 15.8 min. In general the number of females was larger than males because the females lay their eggs in soil so they tend to spend longer time.

The susceptibilty of 3rd larval instar of ***P. fasciata*** and the adults of ***T. squalida*** were tested in the laboratory to there chemical insecticides (Methomyle, Hostathion and Furadon). Values of LC_{50} and LC_{95} were calculated in each case throughout 4 days following the insecticidal applications.