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SHORT NOTE

LABORATORY STUDY OF SOME BIOLOGICAL POTENTIALITIES OF *PULLUS MEDITERRANEUS* (*COL., COCCINELLIDAE*)

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Some biological potentialities of *Pullus mediterraneus* F. (Coleoptera, Coccinellidae) were studied under controlled conditions. Eggs were laid under carapaces of *Saissetia oleae* (Homoptera, Coccidae), which is an important pest of olive trees. The eclosion of eggs occurred after more than 36 days at 7°C, but no more than 1,7 days at 30°C. The eclosion rate of eggs exceeded 80% between 20 and 30°C. In homogeneous juvenile population fed with aphids, 4 instars were distinguished on the basis of the width of the cephalic capsule. Mortality rate was low at all temperature tested. It did not exceed 25% at 20°C and decreased considerably at 30°C when *P. mediterraneus* fed on aphids.

KEY-WORDS: Olive trees, predation.

Several studies have already shown that some parasites belonging to the genus *Metaphycus* and the coccinellid predator *Exochomus quadripustulatus* L. could be good agents to control the black scale *Saissetia oleae* (Homoptera, Coccidae) on olive-trees (Panis, 1974; 1978; Argyriou & Katsoyannos,1976; Blumberg & Swirski, 1977; Paraskakis *et al.*, 1980; Viggiani & Mazzone, 1981; Katsoyannos, 1976). However, the real potential of Coccinellidae as predators of this pest, is still unknown. Among these, *Pullus mediterraneus* F. appears to be a particularly good polyphagous predator (Smirnoff, 1956; Panis, 1977). It is widely present in the orchards of Haouz region (south of Morocco) (Chemseddine, 1988). The study of its biological potentialities constitutes a primordial step in order to analyze its role and to understand better its efficiency to control *S. oleae.*

MATERIAL AND METHODS

Rearings were carried out at 27 ± 2°C, R.H. 50-60% and L:D 16:8 h. The adults were reared in a $9 \times 6 \times 2$ cm box. The bottom of the box was covered with wet filter paper and the top was cut to air. The predator received, *ad-libitum,* young aphid instars which infest the leaves of *Pistacia atlantica.*

EFFECT OF TEMPERATURE ON EMBRYONIC DEVELOPMENT:

200 eggs were divided into 4 batches and placed at 7, 20, 25 and 30°C and at R.H. 70-80%.

EFFECT OF TEMPERATURE ON LARVAL DEVELOPMENT:

Different instars of *P. mediterraneus* were reared individually in the same boxes as described above and received also for food the young aphid instars. Three temperatures were tested (20, 25, and 30°C) at R.H. 40-50% and L:D 16: 8 h)

RESULTS AND DISCUSSION

P. mediterraneus females used the *S. oleae* carapaces previously parasitised and introduced their eggs through the parasite exit hole. Figure 1 shows that the duration of egg incubation varied according to temperature. This duration is about 4.5 ± 1.3 days at 20°C, 2.6 ± 0.7 days at 25°C and 1.7 ± 0.9 days at 30°C. The eggs kept at 7°C (during at least 36 days) did not hatch. However, at the end of this period, 67% of the eggs could resume development. The hatching-rates registered at the three other temperatures exceeded 80% (figure 1).

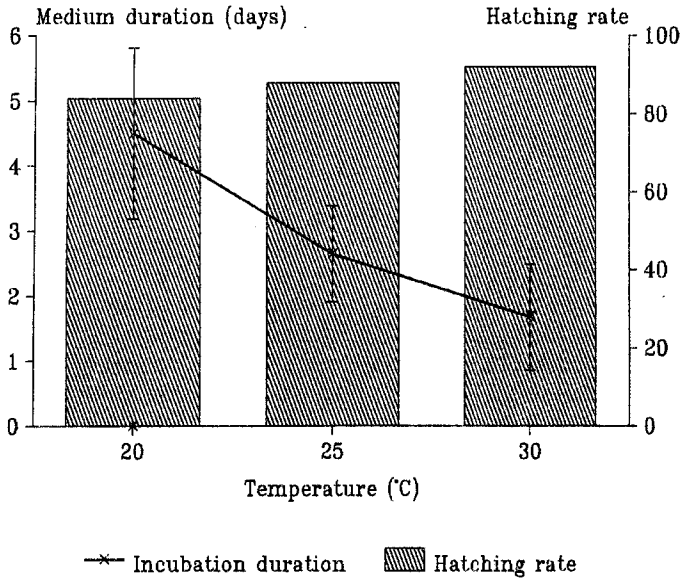

Fig. 1. Duration of incubation and hatching-rate of *Pullus mediterraneus* eggs according to temperature.

Like many Coccinellidae, *P. mediterraneus* presents 4 larval instars which could be differentiated by the maximal width of cephalic capsule and prenymphal and nymphal

stages. The width of the cephalic capsule of the successive larval instars is respectively 0,30 ± 0,02 mm, 0.39 ± 0.01 mm, 0.46 ± 0,01 mm and 0.58 ± 0.02 mm.

Figure 2 shows the duration of the development of different larval instars of *P. mediterraneus* under the three temperatures. The four larval instars needed a short duration to develop. The longest duration were those of the prenymphal and nymphal stages (respectively about 15.5 and 9.1 days at 30°C, 36 and 16 days at 25°C and 33.3 and 20.8 days at 20°C).

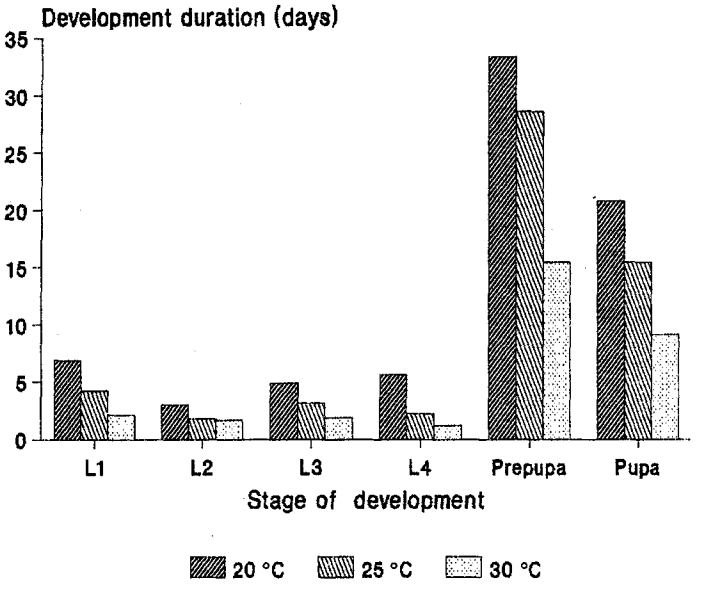

Fig. 2. Variation of larval development duration according to the temperature in *Pullus mediterraneus*.

The death-rate of the different instars of *P. mediterraneus* feeding on young aphid instars was low. Death was observed only in the two first instars at 20 and 25°C (respectively 25 and 8%); at 30°C it affected only the first instar (4%).

From these preliminary results, it appears that the temperature have a great influence on the development cycle of *P. mediterraneus*. It affects the duration of incubation and of development. When the temperature is low (7°C), the embryonic development is stopped. The hatching-rate seems to be independent of temperature. The use of aphids as a substitution food is suitable for a complete development for this predator.

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