gated especially at higher concentration (*i.e.* 500 mg l^{-1}) of each phthalimide.

Gibberellins have been found to be associated with masculinity in several plants[13]. However, in *Ricinus*, the findings of Kumar[7] have demonstrated the enhancement of female flower production by gibberellin which are in conformity with the previous findings of Shifriss[3]. Gibberellin has also been found to promote femininity in other plants as well[14]. It is likely that phthalimides, as reported in cucurbits, act like gibberellin and promote femininity in *R. communis*.

The authors thank CSIR, New Delhi for financial assistance, Dr A. D. Pavlista, American Cyanamid Co., Princeton, N. J. for the gift samples of phthalimides and Mr. P. Narayan for help in conducting the experiment.

30 November 1984

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UPPER LIMIT OF TEMPERATURE FOR THE DEVELOPMENT OF *OOENCYRTUS PAPILIONIS* ASHMEAD WITHIN ITS HOST EGGS

R. P. YADAV* and J. P. CHOUDHURY
Department of Entomology, Haryana Agricultural University, Hissar 125 004, India.
** Department of Entomology, Tirhut College of Agriculture, Dholi, Muzafarnagar 843 121, India.*

THE role of the egg parasitoid *Ooencyrtus papilionis* Ashmead, in regulating the natural population of the sugarcane leaf hopper, (*Pyrilla perpusilla* Walker) in sugarcane belts of this country, has been discussed by many workers[1-4]. The present authors determined the relative performances of this parasitoid over a wide range of temperatures in the laboratory and found the mean temperature around 27.5 ± 1.5°C to be optimal for its reproduction and development. In the present study, attempts were made to determine the upper limit of temperature for embryonic and post-embryonic development of *O. papilionis*.

To meet the experimental requirements, cultures of both host and parasitoid were maintained in the laboratory. Freshly emerged parasitoid adults were released at the rate of 20 pairs per rearing glass tube (10 × 3.75 cm). Five such tubes were prepared and placed at 27.5 ± 1.5°C in a B. O. D. incubator. The adults in each rearing tube were fed on 10% sucrose in water. Five egg-cards, each bearing about 100 fresh host eggs were exposed to parasitoid females, providing one egg-card in each tube. Egg-cards were replaced every 24 hr until all the females died. The egg-cards, were then transferred to test temperatures *viz* 30, 32.5 and 35 ± 1.5°C after 1, 2, 4, 6 and 8 days of parasitization from tubes 1 to 5, respectively. In all cases, the number of eggs displaying symptoms of parasitization, duration of life cycle and the number of male and female parasitoids emerged were recorded and the data are summarised in table 1.

The average number of parasitized host eggs/female at various temperatures remained more or less similar to that at the normal temperature *i.e.* 27.5 ± 1.5°C. In host eggs, shifted to 35 ± 1.5°C after parasitization, minute black spots were visible but there was no parasitoid emergence from them. The developmental duration did not vary much at different test temperatures. It was, however, reduced by about 1 and 2 days at 30 and 32 ± 1.5 C, respectively, when one-day old parasitized host eggs were placed at these temperatures. The adverse effect of temperature above 27.5

Table 1 *Effect of certain high temperatures on the development of Ooencyrtus papilionis Ashmead within the eggs of Pyrilla perpusilla Walker*

Particulars	Temperature (± 1.5 C)	Transfer of host eggs to higher temperature at days after parasitisation 1	2	4	6	8	Development at 27.5 ± 1.5 C
(a) Average number of parasitised eggs female (on the basis of symptoms)	30.0	34 2	33 2	35.2	33.4	34.6	
	32 5	34.4	32.6	35.4	34 2	35 4	34 8
	35.0	35 2[a]	33 6[a]	36.2[a]	34 4[b]	35.2[b]	
(b) Average duration of life cycle (days)	30 0	11.2	11.4	11.6	11.8	12.0	
	32 5	10.6	11.2	11.4	11 6	11 8	12.2
	35 0	—	—	—	—	—	
(c) Percentage of adult emergence	30 0	36.8	87.2	87.6	92.6	95.2	
	32 5	70 4	68.2	69 4	72 8	76 4	97.2
	35.0	0.0	0.0	0.0	0 0	0 0	
(d) Percentage of females	30 0	65.4	66 4	66 8	67 2	66 8	
	32.5	66.2	66.8	65 4	67.3	66 9	66 1
	35.0	—	—	—	—	—	

(Data based on 20 pairs of parasitoid adults)

[a] Only black minute spots on the parasitized eggs were visible through a binocular microscope and the symptoms could not develop further.

[b] Parasitized eggs exhibited clear symptoms but the parasitoid adults failed to emerge from such eggs, because of their mortality.

± 1.5°C on the rate of parasitoid emergence was very pronounced. Rearing at 30 or 32.5 ± 1.5°C resulted in reduced rate of adult emergence (from 95.2 to 86.6 % at 30 ± 1.5°C and from 76.4 to 70.4 % at 32.5 ± 1.5°C). These observations indicated that the younger stages of the parasitoid possessed relatively lower tolerance to temperatures above 27.5°C. The relative sex-ratio of adults at various test temperatures did not differ from that recorded at the normal temperature *i.e.* 27.5 ± 1.5°C.

From the above, it could be concluded that *O. papilionis* failed to complete its life cycle because it died within the eggs of *P. perpusilla* at or above 35°C. The higher the temperature (30 and 32.5 ± 1.5°C) for rearing the parasitoid, the shorter was the duration of development. A mean temperature fluctuating around 32.5 ± 1.5°C seemed to be the upper limit for development and emergence of *O. papilionis*.

The award of an International Development Agency's fellowship to RPY by the Rajendra Agricultural University, Pusa, Samastipur, Bihar is gratefully acknowledged.

26 October 1984; Revised 14 May 1985

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EVALUATION OF DEOILED NEEM (*AZADIRACHTA INDICA* A JUSS) SEED KERNEL AGAINST *TROGODERMA GRANARIUM* EVERSTS.

R. P. SINGH and S. SINGH
Division of Entomology, Indian Agriculture Research Institute, New Delhi 110012, India.

NEEM kernel powder[1] and neem seed oil[2] have been reported as effective grain protectants. Very little information is, however, available regarding the mechanism by which the grains are protected[3]. In the present investigation, therefore, studies were conducted to explore the possibility of utilising deoiled neem kernel powder (hitherto not tested for its biological efficacy against stored grain pests) against khapra beetle (*T. granarium*) as also to find out the mechanism involved in the protection of the grain in the storage.