A PRELIMINARY REPORT ON ARTIFICIAL IMMIGRATIONS OF THE EMBRYOS OF THE SILK SPIDER, NEPHILA CLAVATA, BETWEEN THE TOHOKU DISTRICTS AND THE KANTO DISTRICTS

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In Agelena opulenta L. Koch, Heteropoda venatoria (Linnaeus), and Neoscona nautica (L. Koch), it was suggested that the range of the optimum temperature for embryonic development was surprisingly narrow and was different on each developmental stage. The silk spider, Nephila clavata, widely distributed all over Japan except Hokkaido and passing the winter in embryonic stage, is expected to have different optimum temperature for each

developmental stage and for its locality.

The materials were obtained from Akayu (140 10'E, 38 03'N, 220m alt.), Yamagata Prefecture, the Tohoku districts (designated northern eggs or N-egg) and from Yokohama (139 35'E, 35 29'N, 50m alt.), Zushi (139 35'E, 35 18'N, 20m alt.) or Odawara (139 08'E, 35 15'N, 50m alt.), Kanagawa Prefecture, the Kanto districts (southern- or S-eggs). Egg-cocoons collected in the field or deposited in a laboratory were used for the experiments. Eggs were kept under eaves in Akayu and in the shade of a tree or in a well ventilated laboratory in Funabashi (140 03'E, 35 41'N, 25m alt.), Chiba Prefecture, the Kanto districts. Observations of the embryos were carried out in liquid paraffin. Temperatures at the experimental sites are shown in the table.

Average maximum and minimum temperatures of months (°C).

Localities		1985			1986			
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Funabashi	max	17.5	12.6	6.7	4.2	3.6	7.4	13.2
	min	14.0	8.6	2.8	0.2	-3.1	3.1	9.1
Akayu	max		10.9	3.4	0.1	1.2	5.4	14.0
	min		4.2	-2.2	-6.1	-7.2	-2.2	3.8

Experiment 1 (1984-1985)

Female spiders deposited eggs from late October to mid November. The eggs developed to the blastula within a week, then the development slowed down afterwards. They overwintered during the stages from late germ disc to appearance of cumulus posterior. In Funabashi, eggs developed rapidly in April, then S-eggs reached the stage of embryonic reversion by the end of

April, while N-eggs just before hatching. Late in May, S-eggs hatched, while N-eggs moulted. In Akayu, development was accelerated in May, then S-eggs came to hatching late in May, while N-eggs already hatched.

Experiment 2 (1985-1986)

Interesting additions to the results of Experiment 1 were as follows: (1) N-eggs deposited early in October in Funabashi reached the stage of appearance of cephalothoracic appendages by December, but many of them died soon. In most cases eggs returned to Akayu at germ disc stage early in November developed abnormally or died later, but bringing back again to Funabashi late in December, they developed normally. (2) The eggs of the silk spider adhere tightly each other to form compact egg mass. If an egg mass is unfastened, a mortality increases heavily.