(6) A special design permitted us to adapt individuals to more and more concentrated media, by gradually increasing the sea-water content in the aquarium in which the fish were put, in such a manner that the fresh water was replaced by sea-water, within 28 or 36 hr. When fresh-water replacement was accomplished within 28 hr., all fish without exception died during the 24 hr. following. When the replacement was accomplished within 36 hr., only three individuals (out of fifty fish) died. This means that the minimum time for adaptation to sea-water is about 36 hr.

(7) Several series of 25 individuals each were adapted to sea-water during at least 3 wk.; they were transferred to fresh water and then returned again to sea-water, 24, 36, 48 or 72 hr. after. The results obtained were as follows:

Time (hr., in fresh water)	No. dead
24	none
36	4 individuals
46	8 individuals
72	20 individuals

This means that individuals begin to lose their adaptation to sea-water when kept in fresh water for about 36 hr., that is, the minimum time for adaptation to sea-water is approximately equivalent to that during which the fish keep their adaptation to sea-water.

(8) Having noticed during the previous experiments that males usually die before the females, 100 adult individuals of both sexes were transferred directly to pure sea-water. Five and a half hours after, fish began to die (especially males). Six and a half hours after they began to die, all males were already dead, but only 55 females were quite dead. The remaining females died within the following 12 hr.

We are aware of the probable existence of the factor, namely, weight of the individuals in the mortality, since the youngest adult female is usually heavier than the biggest male. However, we think that this factor is not exclusive. For the same sex (male), the histogram has shown that mortality was not a function of the weight, but represented by a Gaussian curve.

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Effect of Temperature on *Apis indica* Workers

Recent work on the effect of environmental temperature on the European honeybee, *Apis mellifera*[1-3], has been partially repeated with two colonies of *Apis indica* brought from Ceylon by Mr. L. A. S. Perera.

Groups of 100 *A. indica* were kept in cages for three days with sugar syrup (2 parts sugar : 1 part water) and water at temperatures from 20° to 40° C., three groups being kept at each temperature; the amount of food and water consumed, the temperatures at the centres of the groups, and the number of bees which died, were recorded. The results are given in Table 1. Comparable results for *A. mellifera* are in brackets.

Table 1

Environmental temperature (° C.)	Mean temperature of groups (°C.)	Mean consumption (mm.³) per bee per day		Mean No. dead at end of day 1
		Sugar syrup	Water	
20	24·0 (24·9)	17·1 (31·7)	0·1 (0)	8·9 (4·0)
25	29·3 (29·6)	17·2 (21·3)	0·1 (0·3)	5·5 (1·0)
30	31·4 (30·8)	14·3 (11·5)	0·1 (0·5)	4·0 (4·0)
35	35·7 (35·0)	11·6 (18·6)	1·2 (10·1)	1·0 (3·7)
40	39·6 (39·2)	1·9 (5·5)	21·8 (16·7)	15·0 (13·8)

Groups of *A. indica* at 20° and 25° C. took similar amounts of food and were both about 4 deg. C. above environmental temperature but, in general, the lower the environmental temperature the greater the difference between it and the group temperature, and the greater the food consumption. Thus *A. indica* like *A. mellifera* responds to low temperature by increased food consumption, indicating increased metabolism, and increased production of heat. At 40° C. both species took little food but large quantities of water, reflecting a high rate of losing water. The mortality of both species was similar at the higher temperatures, but was greater for *A. indica* at the lower temperatures.

To find the temperature at which the two species enter chill coma single *A. indica* and *A. mellifera* workers were taken from their hive entrances and placed at low temperatures. Table 2 shows the numbers that moved and were still after exposure for 1 hr. All those that were still, moved again when the temperature was raised.

Table 2

Environmental temperature (° C.)	*A. indica*		*A. mellifera*	
	Moved	Still	Moved	Still
8	0	12	0	12
9	0	17	3	15
10	1	30	20	10
11	22	22	33	10
12	15	12	21	3
13	21	4	26	0
14	6	0	6	0

Unfortunately, the *A. indica* colonies died before much information could be obtained on the effect of previous acclimatization on chill coma temperatures. However, after acclimatization at 35° C. for 24 hr. only 6 out of 21 *A. indica* moved at 11° or 12° C., whereas 12 out of 18 *A. mellifera* moved. Thus the species differed in behaviour ($P < 0.05$) even when acclimatized to the same temperature. Both appeared to have a higher chill coma temperature after being kept at temperatures higher than they would have experienced at their hive entrances.

Mellanby[4] found that *Cimex lectularius* (from temperate regions) was more resistant to starvation and desiccation, and could breed more successfully at low temperatures than *C. rotundatus* (from tropical regions) but found no circumstance in which *C. rotundatus* was markedly superior. Our results indicate that *A. mellifera* is more adapted to temperate climates than *A. indica*, but do not show that *A. indica* has any corresponding adaptation to the tropics.

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