EFFECT OF SEVERAL RELATIVE HUMIDITY LEVELS ON EGG DEVELOPMENT, HATCHABILITY AND LARVAL LIFE SPAN OF *ANOCENTOR NITENS* (NEUMANN, 1887) (ACARI: IXODIDAE).

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SUMMARY: The effect of several relative humidity levels on hatching and larval surviving of *Anocentor nitens* was studied under laboratory conditions. Thirteen engorged females (N = 120) were exposed to 30, 50, 70 and 95% relative humidity (r.h.) levels during the egg-laying period. Eggs were collected from each treatment, mixed, separated in 10.0 mg samples and then incubated under one of the previously described humidity levels. Hatching did not occur for those eggs kept and / or moved to the environments with 30 or 50% r.h.. For those moved to 70 % r.h. the humidity level of the previous treatment (during oviposition), did not influence either incubation or hatching periods. Hatching rates for eggs moved from 30 or 50 % to 70% r.h. did not present significative differences, either among them or when compared to controls (70 % r.h.). Differences were found in the comparison between controls and those eggs moved from 95% to 70 % r.h. level. There were no differences for survival periods of larval when groups were moved to 70 % r.h were compared. The mortality period only differed from control (70 %) for those eggs moved from 95 % to 70 % r.h.. Humidity level of the first treatment influenced egg incubation period of eggs moved to 95 % r.h., although it did not influence hatching period, hatching rates or larval surviving rates. The mortality period was influenced by the humidity level of first treatment, only when eggs were moved from 50 or 70 % to 95 % r.h.

KEY WORDS: *Anocentor nitens*, relative humidity, egg development, larval surviving.

INTRODUCTION

The influence of relative humidity on the development and survival of ticks (KNÜLLE, 1996; DÍAZ *et alii*, 1991; DESPINS, 1992), and other arthropods (KNÜLLE & WHARTON, 1964) is already know. Nevertheless, the response to different humidity levels (both fixed and variable) changes with tick species. According to LEES (1946), *Ixodes ricinus* survives only for one or two days when kept at 25 °C and 0 % r.h. while *Dermacentor andersoni* can live up to 27 days. HEATH (1979) kept eggs of three tick species under different temperature and humidity conditions, and observed that when eggs of *Haemaphysalis longicornis* were exposed to low humidity levels (during variable time periods) and then moved to higher humidity levels, a reduction in the incubation period and an increase in egg viability took place. DÍAZ *et alii* (1991) and DESPINS (1992) kept *Anocentor nitens* under different but constant levels of relative humidity and concluded that it led to small changes in tick fertility. EKPENYONG & AKINBOADE (1991) conducted similar experiments with *Amblyomma variegatum*, but these authors did not found any influence of relative humidity on the pre oviposition, oviposition and egg incubation periods. In Brazil, DAEMON & SERRA-FREIRE (1984; 1987) studied the biology of the non parasitic phase of *A. nitens* under constant temperature and humidity conditions (27 ± 1 °C and 80% r.h.). Since there are no reports about the influence of variable relative humidity levels on eggs and larvae of *A. nitens*, this work intend to verify if there is an influence on egg viability, hatchability and larval surviving. The authors use the denomination *Anocentor nitens*, according to the proposal of ESTRADA-PEÑA & ESTRADA-PEÑA (1992).

Table 1 - Period of incubation and hatching, hatching rate, larval survival and mortality of *Anocentor nitens*. When the eggs were moved from humidity levels of 30, 50 and 70% to 95% R.U.

Parameters (period)	Different relative humidity			
	30 →95	50 →95	70→95	95
Incubation (days)	21.0a	19.5b	20.5c	18.44d
Standard desviation	0	0.83	0.54	0.72
Confidence	21	19-21	20-21	17-19
Hatching (days)	6.16a	6.0a	5.5a	5.6a
Standard desviation	0.98	0.63	0.54	0.69
Confidence	5-8	5-7	5-6	5-7
Hatching (%)	97.25a	97.66a	98.50a	98.16a
Standard desviation	1.50	1.50	0.83	1.60
Confidence	95-98	95-99	97-99	95-99
Survival (days)	126a	120.16a	121.33a	124.33a
Standard desviation	2.70	2.92	3.50	4.88
Confidence	124-130	117-124	117-126	117-130
Mortality (days)	61.25a	44.33b	45.5b	67.66a
Standard desviation	6.70	3.61	3.83	3.61
Confidence	56-70	42-49	42.49	63-70

Different letters means significative difference ($P < 0,05$).

Table 2 - Period of incubation and hatching, hatching rate, larval survival and mortality of *Anocentor nitens*. When the eggs were moved from humidity levels of 30, 50 and 95% to 70% R.U.

Parameters (period)	Different relative humidity			
	30→70	50→70	95→70	70%
Incubation (days)	21.83a	20.83a	22.5a	19.22b
Standard desviation	0.48	1.72	1.64	0.83
Confidence	21-22	19-23	21-24	18-21
Hatching (days)	3.75a	4.16a	3.00a	7.10b
Standard desviation	0.5	0.98	1.0	1.37
Confidence	3-4	3-5	2-4	5-10
Hatching (%)	75.25a	77.00a	30.83b	65.00a
Standard desviation	20.66	21.72	26.34	7.45
Confidence	50-99	50-97	0-65	58-75
Survival (days)	61.5a	63.00a	61.5a	63.33a
Standard desviation	1.0	2.96	2.38	6.97
Confidence	60-62	61-69	60-65	55.72
Mortality (days)	49a	50.16a	14b	46.66a
Standard desviation	0	2.85	5.71	13.76
Confidence	49	49-56	7-21	28.63

Different letters means significative difference ($P < 0,05$).

Table 3 - period of incubation and watching, hatching rate, larval survival and mortality rate of *Anocentor nitens* in the control treatments of 70 and 95% RU.

Parameters (period)	Control Treatment	
	70%	95%
Period of Incubation ± sd	19.22 ± 0.83a	18.44 ± 0.72a
Period of Hatching ± sd	7.10 ± 1.37a	5.6 ± 0.69b
Hatching (%) ± sd	65.00 ± 7.45a	98.16 ± 1.60b
Survival ± sd	63.33 ± 6.97a	124.33 ± 4.88b
Period of Mortality ± sd	46.66 ± 13.76a	67.66 ± 3.61b

Different letters means significative difference ($P < 0,05$).

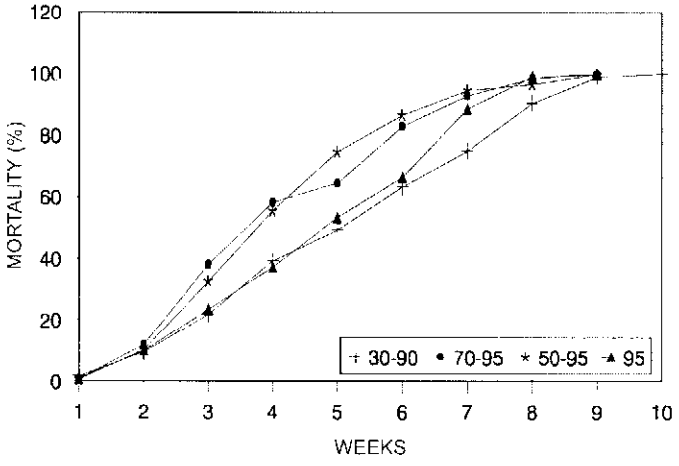

Figure 1 - larval mortality of *A. nitens*, when the eggs were moved from 30, 50 and 70% to 95% RU.

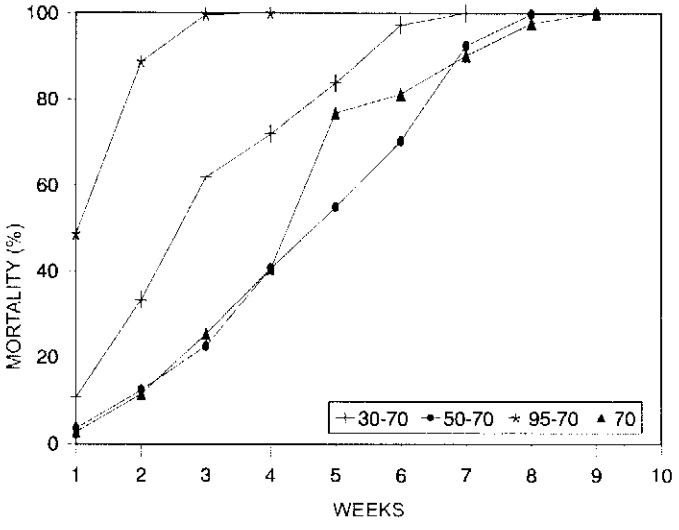

Figure 2 - larval mortality of *A. nitens*, when the eggs were moved from 30, 50 and 95% to 70% RU.

SUMÁRIO

O efeito de teores de umidades relativas variáveis sobre a eclosão e sobrevivência larval de *Anocentor nitens* foi estudado sob condições de laboratório. Trinta fêmeas ingurgitadas foram expostas à teores de umidades relativas (UR) de 30, 50, 70 e 95% para realizarem postura (total = 120 fêmeas). Os ovos coletados de cada tratamento foram misturados, separados em alíquotas de 10,0 mg e transferidos entre os quatro diferentes regimes de umidade. Observou-se que não ocorreu eclosão em posturas mantidas e/ou transferidas para os tratamentos de 30 e 50% UR. Nas transferências para 70% UR verificou-se que a umidade relativa de origem influenciou os períodos de incubação e eclosão. O percentual de eclosão de ovos transferidos de 30% e 50% para 70% UR não diferiu significativamente entre si e nem do controle (70% UR), mas este diferiu quando os ovos foram transferidos de 95 para 70% UR. Não houve diferença significativa para o período de sobrevivência larval comparando-se as transferências para 70% UR. O período de mortalidade apenas diferiu do controle 70% quando os ovos foram transferidos de 95 para 70%. Já nas transferências para 95% UR verificou-se que a umidade de origem também interferiu no período de incubação dos ovos, mas não influenciou no período de eclosão, percentual de eclosão ou sobrevivência larval. Observou-se que o período de mortalidade foi influenciado pela umidade de origem, apenas quando os ovos foram transferidos de 50 e 70 para 95% UR.

PALAVRAS-CHAVE: *Anocentor nitens*, umidade relativa variável, desenvolvimento de ovos, sobrevivência larval

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