

Color pattern changes in *Pachistopelma rufonigrum* Pocock (Araneae, Theraphosidae)

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ABSTRACT. *Pachistopelma rufonigrum* Pocock, 1901 presents ontogenetic changes of its coloration pattern throughout its development. After emergence from the eggs, spiderlings are bluish, with metallic and/or iridescent nuances. The juveniles have a vertically directed black stripe in the central region of abdomen dorsum and three horizontally directed black stripes in the abdomen dorsum. Adults are completely black. These coloration differences between juveniles and adults of the same species appear to be a strategy to avoid the intraspecific competition.

KEY WORDS. Colors, ontogeny changes, spider, Theraphosidae.

RESUMO. *Pachistopelma rufonigrum* Pocock, 1901 apresenta mudanças ontogenéticas no seu padrão de coloração. Após emergirem dos ovos, as pequenas aranhas são azuladas, com nuances metálicas. Os juvenis possuem uma listra negra na região central do dorso do abdômen orientada no sentido vertical e três listras negras no dorso do abdômen orientadas horizontalmente. Os adultos são totalmente negros. Acredita-se que a diferença na coloração entre indivíduos de instares diferentes dentro de uma mesma espécie seja uma estratégia para se evitar a competição intraespecífica.

PALAVRAS CHAVE. Aranha, cores, mudanças ontogenéticas, Theraphosidae.

Despite being so colorful like other arthropods, there are few papers reporting any knowledge on spider coloration. Spiders present a wide range of colors based on integumental chromatic and specific cuticular substances. They also show distinct coloration patterns that change throughout their specific-development. HOLL (1987) pointed out three types of color changes in spiders: morphologic, physiologic and ontogenetic. HOLL (1987) and GRAF & NENTWIG (2001) concluded that ontogenetic changes result in irreversible differences in spider's coloration patterns. Molt after molt, the color (or the coloration pattern) of the spiders can be gradually modified, changing from one instar to another, until spiderlings reach the last developmental stage. During field studies on the behavior ecology of *Pachistopelma rufonigrum* Pocock, 1901 it was able to verify that the juvenile individuals were very different, when compared to the adults, chiefly by noting their distinct coloration. The identification of this specie's for a non-specialist, can be problematic, if comparing spiderlings, juveniles, sub-adults and adults of this same specie due to your coloration changes.

The study area is located at the "Estação Ecológica Serra de Itabaiana", Areia Branca, Sergipe State, Brazil (10°40'S; 37°25'W), where the local vegetation is composed of scattered

shrubs, cactus, bromeliads and white sand soil (VICENTE *et al.* 1997). *Pachistopelma rufonigrum* is found only in tank bromeliads of *Aechmea* Ruiz & Pav. and *Hohenbergia* Schult genera (DIAS & BRESCOVIT 2003). Individuals in several reproductive stages were captured. Notes on their coloration pattern and photographs were taken. One egg sac was maintained at the laboratory to analyze the spiderlings's color after emergence. Voucher specimens are deposited in "Instituto Butantan", São Paulo, Brazil.

Spiderlings were bluish with metallic nuances. This coloration disappears when they are fixed in alcohol. Through their development, the blue shade become clear and a black stripe begin to appear along opisthosoma dorsum center, together joined with three black stripes that begin in the abdomen laterals and end, horizontally, near the black central stripe. As *P. rufonigrum* moves on the juvenile stage, the bluish shade is lost, and all black stripes become more intense while the abdomen portions that are between the stripes develop reddish nuances (Fig. 1). Sub-adult individuals lose the black stripe and both opisthosoma and prossoma hairs developing a black color, although with still noticeable reddish shades, mainly towards the base of abdomen. When adult, *P. rufonigrum* becomes completely black. (Fig. 2). This process occurs both in males and females.



Figures 1-2. *Pachistopelma rufonigrum*: (1) juvenile, with black stripes in the abdomen dorsum and reddish mark's in the final portion of opisthosoma; (2) adult, completely black (photos taken by SCD).

GRAF & NENTWIG (2001), studying the ontogeny of *Eriophora fuliginea* C.L. Koch, 1838, verified that the changes of color occur gradually and that the difference between juvenile and adult coloration could indicate that different instars use different niches to reduce intraspecific competition. According observations, after hatching in natural conditions, the spiderlings disperse, although some juveniles can remain on the same tank bromeliads as the adults. Both juveniles and adults are clearly found separately on this type of plant. This may be due to the difference in the coloration among the different reproductive stages. HOLL (1987) cited that the coloration of spiders could have thermoregulatory, antiradiant, camouflaging and/or advertising functions. Since it is recognized that *P. rufonigrum* is a nocturnal and conspicuous spider (DIAS & BRESCOVIT 2003), Graf-Nentwig's proposal of competitive exclusion among spiders of the same species in function of the coloration differences is probably the most acceptable.

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