

**INTRA- AND INTERSPECIFIC VARIATION  
IN THE GENUS *URACIS* RAMBUR, 1842,  
WITH A KEY TO THE KNOWN SPECIES  
(ANISOPTERA: LIBELLULIDAE)**

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Based on 1200 adult specimens of both sexes, mostly from Brazil, the extend of variation in wing coloration and in the number of cross-veins is analyzed in 5 of the 7 known spp., viz. *fastigiata* (Burm.), *imbuta* (Burm.), *infumata* (Ramb.), *ovipositrix* Calv., and *siemensii* Kirby. It is concluded, sympatric spp. may present similar color patterns, therefore the latter can not be utilized to differentiate between the taxa.

**INTRODUCTION**

*Uracis* Rambur is a neotropical genus, characterized by some primitive venational features, such as the position of arculus between 2nd and 3rd antenodals, the base of wing narrow, increased number of cubital cross-veins, and the hind wing triangle distal of arculus. Out of the 7 nominal species (DAVIES & TOBIN, 1985), *fastigiata* (Burm.), *imbuta* (Burm.), *infumata* Ramb., *ovipositrix* Calv., *reducta* Fraser and *siemensii* Kirby, are distributed in South and Central America, while *turrialba* Ris is confined to Central America.

In order to assess the extend of intra- and interspecific variation in wing coloration and in the number of cubital cross-veins, we have analyzed 1200 specimens of both sexes, pertaining to 5 species, from various localities, mostly from Brazil (cf. Tab. I).

CALVERT (1948) suggested that those *imbuta* individuals which have the proximal side of the hind wing triangle at the arculus, represent a more primitive state for the genus, while the *imbuta* individuals with the distally placed proximal side of the triangle, and also the other congeners, display a more specialized condition. We agree with Calvert, but so only with reference to *imbuta* and *fastigiata*, since in

all other analyzed species the proximal side of the hind wing triangle occurs distally of arculus.

#### PROVENIENCE OF MATERIAL EXAMINED

*Uracis fastigiata*: BRAZIL, Amazonas (São Paulo Olivença, Manaus, Manicoré, Jurúá, Canamari, Eirunepé, Benjamin Constant, Tabatinga); - Acre (A. Feijó, Taracá); - Amapá (Serra do Navio); - Rondônia (Ouro Preto d'Oeste); - Roraima (Nova Vida, Ariquemes, Colônia Apiáu); - Tocantins (Santa Fé); - Pará (Fordlândia, Óbidos, Belém, Tucuruí); - Maranhão (Rosário); - Paraíba (Areia); - Bahia (Itabuna); - Mato Grosso (Barra dos Bugres, Diamantina); - PERU, Satipo. - *U. imbuta*: BRAZIL, Amazonas (Manaus, Careiro, Estirão do Equador, Janereté, Manicoré, São Paulo Olivença, Médio Javari, Benjamin Constant, Tabatinga, Aldeia Kasawá, Taracá, Uapés); - Amapá (Serra do Navio, Porto Platon, Oiapoque); - Pará (Belém, Conceição do Araguaia, Benevides, Benfica, Fordlândia, Santo Antônio do Tauá, Tiriós, Carajás, Tucuruí, Paricatuba, Paragominas, Aura, Altamira); - Roraima (Ariquemes, Maracá, Igarapé Macapiau); - Rondônia (Gidanana, Ouro Preto d'Oeste, Pimenta Bueno); - Maranhão (Rosário, Imperatriz); - Piauí (Teresina); - Ceará (Ubajara); - Pernambuco (Recife, Jaboatão, São Lourenço da Mata, Ipojuca, Igarapé, Caruaru); - Alagoas (Maceió); - Bahia (Jeriperi, Jaguariju, Salvador, Valença); - Goiás (Emas, Brasília, Jataí); - Mato Grosso (São Félix do Araguaia, Diamantina, Utiariti, Chapada dos Guimarães, Barra dos Bugres); - Paraná (Curitiba); - COLOMBIA, Rio Negro. - *U. infumata*: BRAZIL, Amazonas (Manaus, São Paulo Olivença, Janereté, Eirunepé); - Pará (Conceição do Araguaia); - Rondônia (Porto Velho, Vilhena); - Mato Grosso (Diamantina, Sinop); - PERU, Lima. - *U. ovipositrix*: BRAZIL, Amazonas (Marmelos, Manaus, São Paulo Olivença, Taracá, Manicoré, Aldeia Kasawá); - Pará (Serra da Macacheira, Fordlândia, Belterra, Carajás, Itaituba, Santarém); - Roraima (Caracarai); - Rondônia (Ouro Preto d'Oeste); - Amapá (Serra do Navio, Médio Amapari); - Acre (Cruzeiro do Sul); - Mato Grosso (São Félix, Barra dos Bugres); - São Paulo (Penápolis); - Santa Catarina (Rio das Antas); - PERU, Rio Jucuri. - *U. siemensii*: BRAZIL, Amazonas (Manaus, Posto Xingu, Parintins, Aldeia Kasawá, Manicoré, Eirunepé, São Paulo Olivença); - Pará (Belém, Cachimbo, Carajás, Óbidos, Porteira, Belterra, Fordlândia, Conceição do Araguaia, Marmelos, Tiriós, Arapium, Aldeia Mapuera); - Rondônia (Vilhena); - Maranhão (Santa Luzia); - Mato Grosso (Utiariti, Sinop, Diamantina, Araguantins, São Félix); - Minas Gerais (Riacho Fundo); - Goiás (Emas); - São Paulo (Penápolis).

The numbers and the general provenience of the specimens studied are given in Table I.

Table I  
Number of *Uracis* specimens examined

Species	Brazil					Other countries	Total
	North	Northeast	Center-West	Southeast	South		
<i>fastigiata</i>	95	3	8	-	-	4	110
<i>imbuta</i>	626	166	39	-	1	1	833
<i>infumata</i>	36	-	4	-	-	2	42
<i>ovipositrix</i>	66	-	5	1	2	1	75
<i>siemensii</i> ♂	62	1	10	1	-	-	74
<i>siemensii</i> ♀	54	-	11	1	-	-	66
Total	939	170	77	3	3	8	1.200

## SPECIES DESCRIPTIONS

*URACIS FASTIGIATA* (BURMEISTER, 1839)

Figures 1, 2a

In wing coloration, three types could be discerned, viz. (1) apical spot surpassing the proximal side of pterostigma, – (2) not surpassing, and – (3) wings hyaline.

While in specimens from NE Brazil and Peru the apical spot does not surpass the proximal side of pterostigma, in the Center-West region of Brazil this condition was found in 87% of specimens (in 13% it does surpass), and in northern Brazil the three types were represented in resp. 15, 80 and 5% of the examined specimens.

There are 5-7 cubital cross-veins in the fore wing, while 5-6 of these were counted by CALVERT (1902), who called them the “submedian” cross-veins.

*U. IMBUTA*  
(BURMEISTER, 1839)

Figures 1, 2b

The two types discerned in wing coloration are: (1) apical spot not surpassing the proximal side of pterostigma, and – (2) wings hyaline.

The first condition occurred in all specimens from NE Brazil, in 96.5% from northern Brazil, in 95% of those from the Brazilian Center-West Region, as well as in the 2 specimens examined from southern Brazil and from Colombia. In all others the wings were hyaline.

The number of cubital cross-veins in the fore wing varied between 1 and 3.

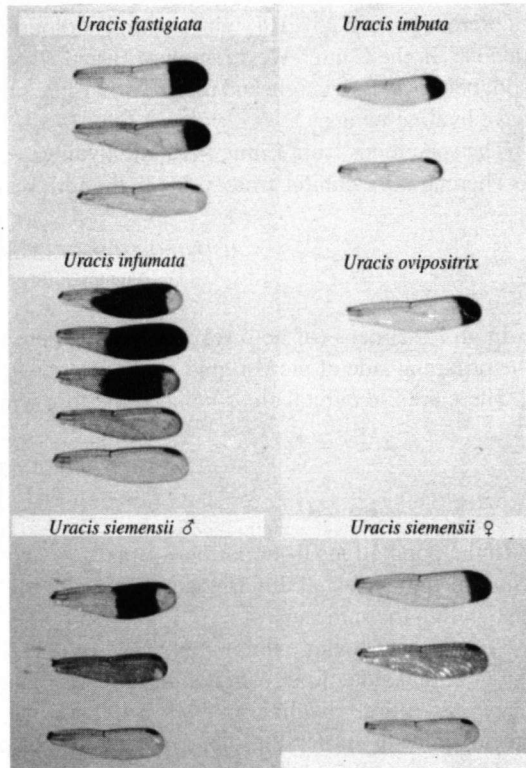


Fig. 1. Variation of wing coloration in five *Uracis* species

*U. INFUMATA* (RAMBUR, 1842)

Figures 1, 2c

The wings are either hyaline or spotted, and there is a variation in the size of the spot.

In northern Brazil the variation is as follows: (1) a spot occurs between triangle and the proximal side of pterostigma in 5.5% of individuals, (2) apical spot reaching the subnodus, in 5.5%, (3) a spot between the subnodus and the proximal side of pterostigma, in 25%, (4) wings entirely coloured, in 11%, and (5) wings hyaline, in 53%. In the Center-West region of Brazil, 75% of examined individuals have a spot between the triangle and the proximal side of pterostigma, the remaining 25% have hyaline wings.

The specimens from Lima, Peru, are hyaline.

There are 5-7 cubital cross-veins in the fore wings.

*U. OVIPOSITRIX* CALVERT, 1909

Figures 1, 2d

In all specimens (of both sexes) studied, there is an apical spot, not surpassing the proximal side of pterostigma.

There are 2-4 cubital cross-veins in the fore wing.

*U. SIEMENSII* KIRBY, 1897

Figures 1, 2e-f

In the populations from northern Brazil and from the Brazilian Center-West region, there is a sexual dimorphism, coupled with the variation in wing coloration also within the same sex.

The northern males exhibit 3 patterns, viz. (1) a spot between the subnodus and the proximal side of pterostigma, in 55%, (2) wings entirely coloured, in 5%, and (3) wings entirely hyaline, in 40%. Similar is the situation in the females: (1) an apical spot not surpassing the proximal side of pterostigma, in 20%, (2) wings entirely coloured, in 5%, and (3) wings entirely hyaline, in 75%.

In males from the Center-West region, there is either a spot between subnodus and the proximal side of pterostigma (50%), or the wings are hyaline (50%). All females from this region have hyaline wings.

In southeastern Brazil, there is no variation: the wings are hyaline in both sexes.

It should be noted that in all individuals as described above under (1), there is a light spot near the wing base, alternating from white to brownish, depending on the angle of observation.

There are 2-4 cubital cross-veins.

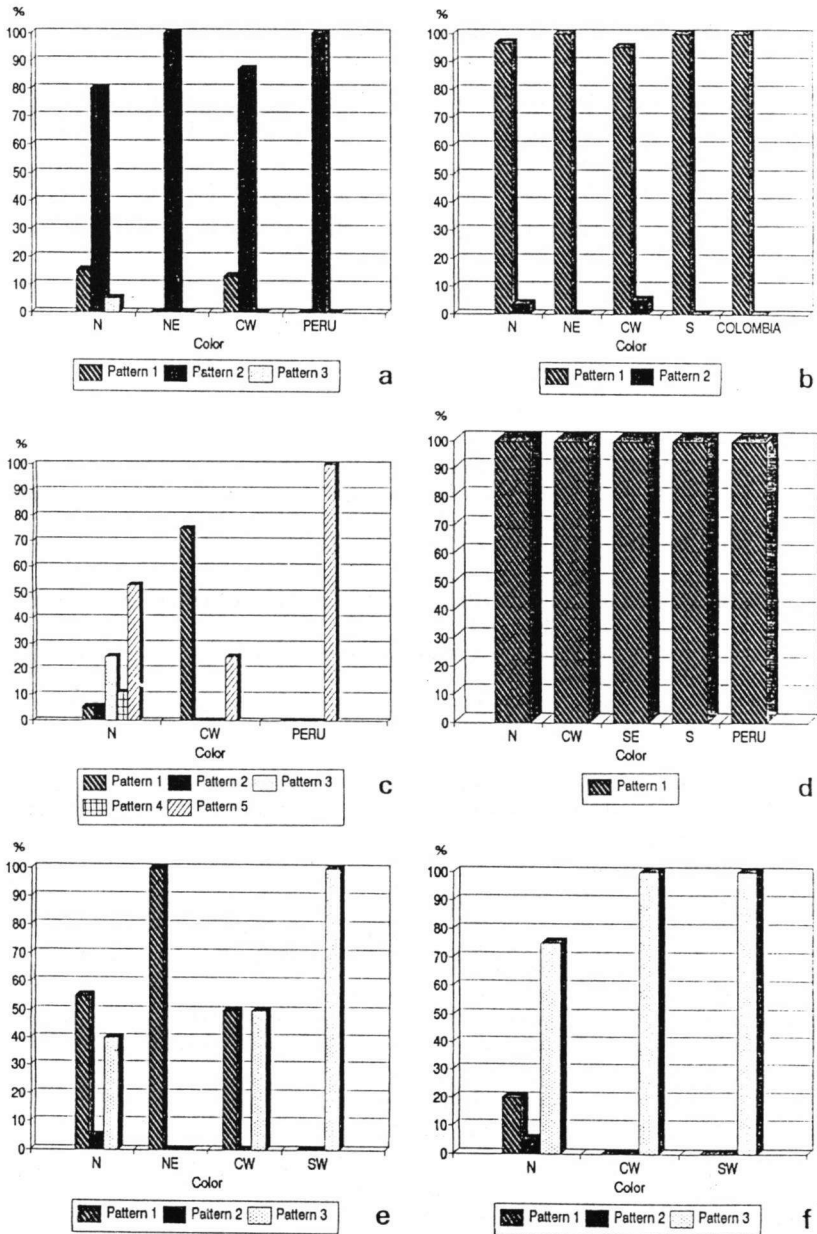


Fig. 2. Geographic variation of wing coloration in five *Urucis* species (for pattern descriptions see text): (a) *U. fastigiata*; – (b) *U. imbuta*; – (c) *U. infumata*; – (d) *U. oviposatrix*; – (e-f) *U. siemensii*, (e): ♂, – (f): ♀. – [Regions of Brazil: N = North; – NE = Northeast; – CW = Center-West; – SE = Southeast; – S = South; – SW = Southwest]

## CONCLUSION

Due to the considerable geographic variation, in *Uracis* the color of the wings does not allow a precise species identification, the sympatric species may present the same wing color patterns.

On the other hand, the intraspecific variation in the number of the cubital cross-veins is small, therefore this is considered a relatively reliable feature in discrimination between the species.

## KEY TO THE SPECIES

- 1 Triangle of hind wing crossed; subtriangle of fore wing with 3-5 cells ..... 2
- 1' Triangle of hind wing free; subtriangle of fore wing with 3-4 cells ..... 5
- 2 Supratrangles of fore wings free; fore wing with 1-3 cubital cross-veins ..... *imbuta*
- 2' Supratrangles of fore and hind wings crossed; fore wing with 3-7 cubital cross-veins ..... 3
- 3 Discoidal field of hind wing with 2 rows of cells, reaching or surpassing the level of bifurcation of M1+2 ..... *fastigiata*
- 3' Discoidal field of hind wing with 1 row of cells reaching or surpassing the level of bifurcation of M1+2 ..... 4
- 4 Discoidal field in fore wing with 2-3 cells, followed of 2 rows of cells, reaching or surpassing the level of subnodus; 1 row of cells in anal field ..... *infumata*
- 4' Discoidal field in fore wing with 3 cells, followed of 2 rows of cells, reaching the level of subnodus; 2 rows of cells in anal field ..... *turrialba*
- 5 One cubital cross-vein in fore and hind wing; supratriangle in fore wing crossed; discoidal field in fore wing with 2 rows of cells, surpassing the subnodus ..... *reducta*
- 5' Two to four cubital cross-veins in fore wing; supratriangle in fore and hind wings free; discoidal field in fore wing with 3 cells, followed by 2 rows of cells, until the subnodus ..... 6
- 6 Anal field with 3 rows of cells; discoidal field in hind wing with one row of cells, not reaching the level of bifurcation of M1+2 ..... *ovipositrrix*
- 6' Anal field with 2 rows of cells; discoidal field in hind wing with one row of cells reaching or surpassing the level of bifurcation of M1+2 ..... *siemensii*

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