# Spiders of the Galápagos. Part V. Linyphiidae\*

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### Summary

Nine linyphiid species are cited from the Galápagos archipelago. Six of them are new (Erigone miniata sp. n., Neocautinella ochoai sp. n., Meioneta arida sp. n., Meioneta galapagosensis sp. n., Meioneta albomaculata sp. n. and Meioneta pinta sp. n.). For one of them a new genus had to be erected (Neocautinella gen. n.). Frontina elegans Keyserling, 1891, Neriene gamma F. O. P .-Cambridge, 1902, Neriene emarginata F. O. P.-Cambridge, 1902 and Neriena convexa F. O. P.-Cambridge, 1902 are newly synonymised with Frontina excelsa Keyserling, 1886 under the new combination Notiohyphantes excelsus (Keyserling, 1886). Their detailed distribution over the islands is given and for some of them (Erigone atra (Blackwall, 1833), Notiohyphantes excelsus (Keyserling, 1886) and Laminacauda dentichelis Millidge, 1985) their zoogeographic affinities with the mainland.

### Introduction

An araneological investigation of the Galápagos Islands was started in 1982 (February-May) and continued in 1986 and 1988 (February-April). In the course of those visits all major islands and volcanoes were visited at least once and sampled along a transect to the top.

Complete surveys on the distribution of the identifiable spider species found in 1982 and 1986, supplemented with the available data from the literature and from collections of other institutions, are given in Baert & Maelfait (1986b) and Baert, Maelfait & Desender (1989). So far four papers have been published with descriptions of new species (Baert & Maelfait, 1983, 1984, 1986a; Baert, 1987).

According to the literature the Linyphildae seemed to be poorly represented on the islands. In the first checklist of Galápagos spiders (Roth & Craig, 1970) two linyphild spiders were cited from Isla Santa Cruz, one as a *Linyphia* sp. and the other as a genus? near *Meioneta*. In the course of our successive expeditions to the Galápagos Islands (by Baert and Maelfait in 1982, by Baert, Maelfait and Desender in 1986, and by Baert, Desender and Maelfait in 1988) nine species were caught, mostly at the highest altitudes.

Most linyphiid species encountered on the islands are the most numerous species in the habitats where they were found. The reasons why so few were captured during previous expeditions are probably that (except for *Notiohyphantes excelsus*) they live in the litter layer and that most previous collectors limited their samplings to the coastal regions.

The paratypes are listed under the heading "Material examined". Under the heading "Distribution" all islands are cited for which data exist. These data are indicated on the distribution maps. All measurements are in mm.

\*Contribution no. 437 of the Charles Darwin Research Foundation.

*Distribution:* Isabela (Cerro Azul and Volcán Sierra Negra), San Cristóbal, Santa Cruz and Santiago (see Map 1).

*Habitat:* This species was found in the highlands of the above islands in the fern-sedge zone (grassy vegetation), but also in the meadows of the culture zone. Often in wet situations (near ponds).

Zoogeographic affinities: Nearctic and Palaearctic Regions. The climatic conditions found on the highlands of the Galápagos Islands are more or less comparable with those of spring in the temperate Nearctic and Palaearctic zones. This might explain its occurrence on the islands, especially as this species is one of the strongest aeronautic spiders. It has been reported from aeroplane catches at various altitudes (Bristowe, 1939).

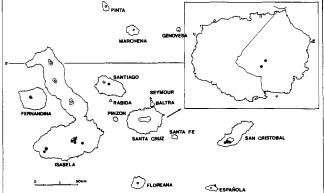
#### Erigone miniata sp. n. (Figs. 1-4)

Holotype: Male holotype from Isla Santiago, highland at altitude 870m, campsite near "Los Jaboncillos", 7 March 1986, leg. Baert, Maelfait & Desender. All specimens cited in "Material examined" are paratypes. Holotype at KBIN, Brussels, paratypes at KBIN, Brussels and at Carleton University, Ottawa (Canada) (S. B. Peck).

Male: Total length 1.20-1.29 (holotype 1.29), carapace length 0.59-0.65 (holotype 0.65), width 0.40-0.50 (holotype 0.50). Carapace brown with dark striae, eye area black; chelicerae brown; labium and sternum shiny chestnut brown with wrinkled appearance; legs vellow to yellow-brown, Ti and Mt suffused with black; abdomen dark grey. Edges of carapace with short little teeth. Chelicerae robust with anterolateral row of small setigerous tubercles, promargin with 4 teeth bearing a short hair at their apex. Pedipalp: Fe with ventral row of three setigerous tubercles, Pa with very small ventral apophysis. Eyes: PME 0.6 of their diameter apart; AME slightly more than 0.4 of their diameter apart. Clypeus length three times diameter of AME. Legs: Tm I 0.42 (holotype) - 0.46. Ti I-III with 2 dorsal spines, Ti IV with one. Palpal organ as in Figs. 1-2, palpal tibia as in Fig. 3.

*Female:* Total length 1.24-1.30, carapace length 0.57-0.63, width 0.40-0.43. Carapace much darker than





Map 1: Distribution of Erigone atra (Blackwall, 1833).

in male; Ti, Pa and Mt dark suffused; chelicerae without warts. Cheliceral teeth: 4 on promargin and 2 on retromargin. Tm I 0.48-0.49. Vulva as in Fig. 4.

*Diagnosis:* The male is diagnosed by the form of the palpal organ and the female by the epigynum and vulva.

*Etymology:* The specific name refers to its small size.

Material examined (paratypes): Jacquemart, 1974: PINTA: Dry pasture, 28 March (10<sup>\*</sup>). Schatz, 1985: SANTA CRUZ: Cerro Crocker, leaflitter of *Scalesia*, alt. 700m, 8 Feb. (10<sup>\*</sup>); SAN CRISTOBAL: El Junco, *Miconia* zone, 28 March (299). Peck, 1985: SANTA CRUZ: Los Gemelos, *Scalesia* wood, alt. 570m, 15 July (399).

Distribution: Pinta, Santa Cruz, San Cristóbal and Santiago (see Map 2).

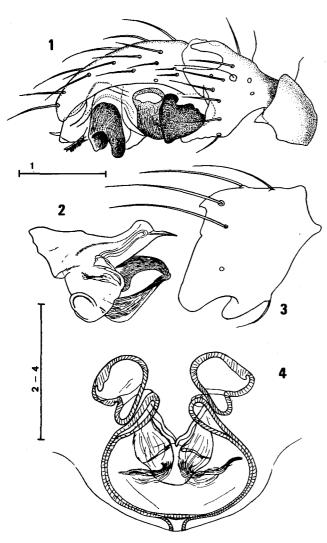
Habitat: Lives in the Scalesia zone.

Notiohyphantes excelsus (Keyserling, 1886), new combination (Figs. 5-6)

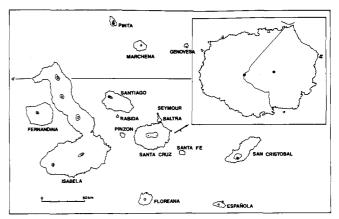
Frontina excelsa Keyserling, 1886: 114, pl. 15, fig. 197 (Q, BMNH, examined).

Frontina excelsa: Keyserling, 1891: 237, pl. 9, fig. 179.

Linyphia excelsa: Petrunkevitch, 1911: 249; Roewer, 1942: 588; Bonnet, 1957: 2591.



Figs. 1-4: Erigone miniata sp. n. 1 Male palp, ectal view; 2 Embolic division, ventral view; 3 Palpal tibia, dorsal view; 4 Vulva, ventral view. Scale lines = 0.1 mm.



Map 2: Distribution of Erigone miniata sp. n.

Frontina elegans Keyserling, 1891: 233, pl. 9, fig. 174 (O' type, BMNH, examined). New Synonymy.

Linyphia elegans: Bonnet, 1957: 2499.

Notiohyphantes elegans: Millidge, 1985: 20, figs. 69-70.

- Linyphia elegantula Roewer, 1942: 588 (nomen novum for F. elegans, preoccupied in Linyphia).
- Neriene gamma F. O. P.-Cambridge, 1902: 419, pl. 39, fig. 14 (♂ type, BMNH, examined). New Synonymy.
- Linyphia gamma: Petrunkevitch, 1911: 249; Roewer, 1942: 588; Bonnet, 1957: 2504.

Neriene emarginata F. O. P.-Cambridge, 1902: 419, pl. 39, fig. 16 (\$\overline\$ type, BMNH, examined). New Synonymy.

Linyphia emarginata: Petrunkevitch, 1911: 249; Roewer, 1942: 588; Bonnet, 1957: 2500.

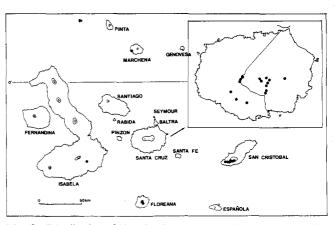
Neriene convexa F. O. P.-Cambridge, 1902: 419, pl. 39, fig. 17 (\$\overline\$ type, BMNH, examined). New Synonymy.

Linyphia convexa: Bonnet, 1957; 2498.

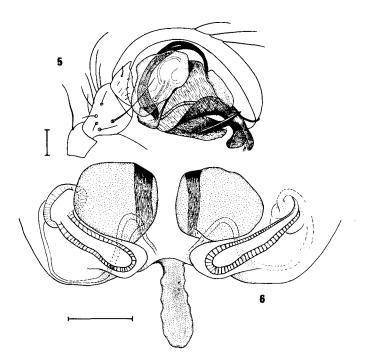
Linyphia convexana Roewer, 1942: 587 (nomen novum for N. convexa, preoccupied in Linyphia).

A good short description of the species is given in Millidge (1985: 20), so only drawings of the male and female genitalia are given here (Figs. 5-6). There are some minute differences that might be the result of the isolation of the populations on the islands.

Comparison of the palpus of the male types of *Neriene gamma* and *Frontina elegans* and the epigynes of the female types of *Frontina excelsa*, *Neriene emarginata* and *Neriene convexa* showed that they all belong to the same species as that found on the islands. The large numbers of both sexes collected in the same localities in different years clearly show that these 5 species are synonyms, *excelsa* having priority.



Map 3: Distribution of Notiohyphantes excelsus (Keyserling, 1886).



Figs. 5-6: Notiohyphantes excelsus (Keyserling, 1886). 5 Male palp, ectal view; 6 Vulva, ventral view. Scale lines = 0.1 mm.

Distribution: Floreana, Isabela (Volcán Sierra Negra), Marchena, San Cristóbal and Santa Cruz (see Map 3).

Habitat: This species occurs mostly in the open (grass vegetation, herb and bush layer) on higher parts of the islands (fern-sedge zone), but can also be found in open habitats in the lower zones (transition zone, culture zone, *Scalesia* wood and *Miconia* zone).

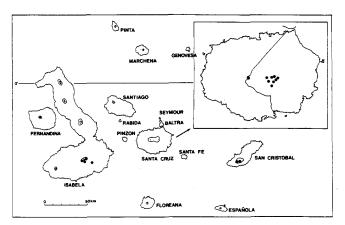
Zoogeographic affinities: Peru (Nancho), Brazil (Rio Negro, Prov. Rio Grande do Sul), Guatemala (Coban), Mexico (Atoyac) and Costa Rica.

### Laminacauda dentichelis Millidge, 1985 (Figs. 7-9)

Laminacauda dentichelis Millidge, 1985: 37, figs. 140, 145, 146.

A good description of the species is given by Millidge (1985). Drawings of the male and female genitalia only are given here (Figs. 7-9) to show the very small differences which could be the result of isolation of the populations on the islands.

Distribution and habitat: Restricted to the open



Map 4: Distribution of Laminacauda dentichelis Millidge, 1985.

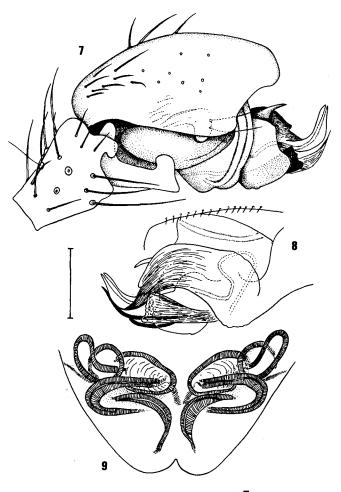
habitats (fern-sedge zone) of the highlands of Isabela (Volcán Sierra Negra), San Cristóbal and Santa Cruz (see Map 4).

Zoogeographic affinities: Panama (Cerro Punto, Chiriqui).

# Genus Neocautinella gen. n.

Diagnosis of genus: Based on single new species. Carapace unmodified. Legs long and slender. Dorsal tibial spines 2-2-2-2 (proximal spine longest, more than twice tibia diameter). Metatarsus IV without trichobothrium. Tm I 0.36-0.44. Claws unpectinate. Male palpal organ with well-developed tegulum, ectally covering suprategulum and basal part of embolic division. No suprategular apophysis. Embolic division an elongated plate from which strong needle-like embolus arises; dorsally strongly sclerotised and envelops embolus and embolic membrane. Paracymbium small and stout. Cymbium with median ectal lobe. Genital openings located in centre of shallow atrium, spermathecae round, and ducts follow convoluted course to openings.

Affinities: This new genus seems to be close to Cautinella Millidge, 1985 (no suprategular apophysis) and Sphecozone O. P.-Cambridge, 1870 (no definite suprategular apophysis). The epigynum shows some similarities with the epigynum of the species belonging



Figs. 7-9: Laminacauda dentichelis Millidge, 1985. 7 Male palp, ectal view; 8 Palpal organ, mesal view; 9 Vulva, ventral view. Scale line = 0.1 mm.

to such genera as Sphecozone, Ceratinopsis Emerton, 1882 and Grammonota Emerton, 1882.

*Etymology:* The generic name refers to the most related genus.

Type species: Neocautinella ochoai sp. n.

### Neocautinella ochoai gen. n., sp. n. (Figs. 10-13)

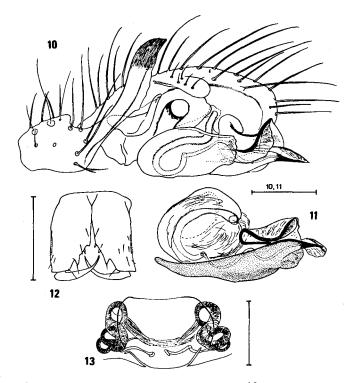
Holotype: Male holotype from Isla Santa Cruz, Media Luna, 10 March 1982. All types at KBIN, Brussels.

*Male:* Total length 2.0-2.43 (holotype 2.34). Carapace length 0.86-1.10 (holotype 1.05), width 0.67-0.85 (holotype 0.84). Carapace yellow to orangebrown, with black eye area. Abdomen greyish with creamy dorsum, sometimes totally white or creamy. Sternum smooth, suffused with black. Legs yellow to orange-brown. Chelicerae (Fig. 12) with four prolateral and four retrolateral teeth and anterior pointed boss with a hair at its tip. Male palpal organ (Fig. 11) as described in genus diagnosis, tibia with long broad blade-like lateral apophysis (Fig. 10). Tm I (holotype) 0.40.

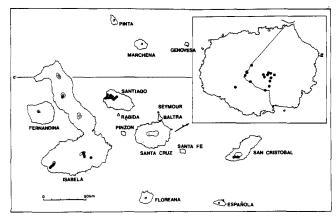
*Female:* Total length 2.54-2.90. Carapace length c. 1.20, width c-0.86. As male, but abdomen darker with sometimes pattern of anterior spots and posterior chevrons. Chelicerae with five strong prolateral and retrolateral teeth. Vulva as in Fig. 13.

*Etymology:* The specific name is in dedication to Ir. Umberto Ochoa, Intendente of the Servicio Parque Nacional de Galápagos.

*Diagnosis:* The male is diagnosed by the form of the palpal organ and the female by the form of the epigynum and vulva.



Figs. 10-13: Neocautinella ochoai gen. n., sp. n. 10 Male palp, ectal view; 11 Embolic division + tegulum; 12 Male chelicerae; 13 Vulva, ventral view. Scale lines = 0.1 mm (10, 11, 13), 0.5 mm (12).



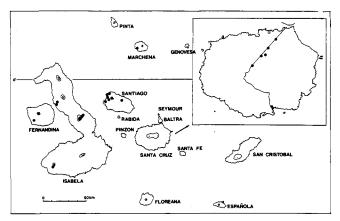
Map 5: Distribution of Neocautinella ochoai gen. n., sp. n.

Material examined (paratypes): Baert & Maelfait, 1982: SANTA CRUZ: Pampa near or east of Media Luna, alt. 600-680m, 10 Feb. (40'0', 299), 8 March  $(220^{\circ}0^{\circ}, 2199)$ , 9 March  $(40^{\circ}0^{\circ}, 899)$ , 10 March  $(90^{\circ}0^{\circ}, 69^{\circ})$ ; north east of Cerro Crocker, alt. 570m, 9 March (pampa)  $(50^{\circ}0^{\circ}, 999)$ , 9 March (Scalesia)  $(10^{\circ}, 399, j)$ ; Los Gemelos, alt. 630m, 13 March (5QQ); El Chato, alt. 280m, 30 March  $(10^{\circ}, 1Q)$ . Baert, Maelfait & Desender, 1986: SANTA CRUZ: Southern flank, culture zone, alt. 230m, 15 Feb. (2QQ); alt. 350m, 15 Feb. (6QQ), 1 March  $(10^{\circ})$ ; alt. 500 m, 1 March (1 $^{\circ}$ ); Los Gemelos, alt. 630 m, 15 Feb. (pampa)  $(20^\circ O^\circ, 39^\circ Q)$ , 12 March (Scalesia)  $(10^\circ)$ ; northern flank, alt. 500m, 1 March (20°0°), 12 March  $(10^{\circ}, 19)$ ; Media Luna trail, alt. 350m, 16 Feb. (299), 28 Feb. (10<sup>\*</sup>), 13 March (30<sup>\*</sup>0<sup>\*</sup>); pampa east of Media Luna, alt. 600-630m, 16 Feb. (170'0', 1499), 13 March  $(10^{\circ}, 299)$ . Baert, Desender & Maelfait, 1988: SANTA CRUZ: Los Gemelos, alt. 630m, pampa, 7 March (2QQ), 2 Apr. (1O), Scalesia, 7 March (70<sup>°</sup>0<sup>°</sup>, 799, js), 2 Apr. (10<sup>°</sup>, 599, js); Media Luna trail, Miconia, alt. 550m, 8 March (10, 19), 2 Apr.  $(10^{\prime}, 299, js)$ ; trail to Cerro Crocker, alt. 700m (pond), 8 March (1Q); between Cerro Puntudo and Cerro Crocker, alt. 750m, 8 March (3QQ), 2 Apr.  $(10^{\circ}, 1^{\circ})$ ; Cerro Crocker, crater floor, alt. 800m, 8 March  $(30^{\circ}0^{\circ}, 29^{\circ})$ , Sphagnum, alt. 825 m, 8 March  $(80^{\circ}0^{\circ}, 1399)$ , 2 Apr.  $(10^{\circ}, 19)$ , top, alt. 875m, 15 Feb. (1♂), 8 March (90°0°, 2199), 2 Apr. (299). Schatz, 1985: SANTA CRUZ: Cerro Puntudo, alt. 720 m, 10 March (40°0°, 299), 8 Feb. (10°); Los Gemelos, 19 Apr. (10°, 299); Media Luna trail, *Miconia*, alt. 560-600 m, 6 Feb.  $(10^{\circ})$ , 10 March  $(19^{\circ})$ .

For localities of non-typic material see Map 5.

*Distribution:* Isabela (Cerro Azul, Volcán Sierra Negra and Volcán Darwin), San Cristóbal, Santa Cruz and Santiago.

Habitat: A pronounced preference for open grassy vegetation. On Santa Cruz it is very abundant in the fern-sedge zone (above 600 m altitude), less common in the *Scalesia* and *Miconia* zones and only sporadic in the transition zone. On Santiago it was found mostly in the highlands, but, as far as is known, it descends as far as an altitude of 500 m along the northern flank and as far as the coast (Playa Espumila) along the southwestern



Map 6: Distribution of Meioneta arida sp. n.

flank. The species is less abundant on San Cristóbal and the Isabela volcanoes. On San Cristóbal it did not occur below 500m (1 female was found at Puerto Baquerizo Moreno). It occurs at the highest altitudes on the southern Isabela volcanoes; on Cerro Azul from 700m to the top, on Sierra Negra in meadows around Santo Tómas and at the top of the caldera. It seems absent on the northern volcanoes Alcedo and Wolf, but a female was found in a lava tunnel at 1200m on Volcán Darwin.

Zoogeographic affinities: Known only from the Galápagos.

### Meioneta arida sp. n. (Figs. 14-22)

*Holotype:* Male holotype from Isla Isabela, Beagle crater, western flank, 22 Feb. 1982. All types at KBIN, Brussels.

Male: Total length 1.47-1.90 (holotype 1.81). Carapace length 0.67-0.80 (holotype 0.78), width 0.46-0.61 (holotype 0.63). Carapace brown suffused with black; sternum shiny brown strongly suffused with black; maxillae and labium orange-brown; legs orangeyellow with retro- and prolateral sides suffused with black; abdomen greyish to creamy. Carapace (Figs. 14, 15) with slightly elevated head region; chelicerae robust, strongly modified, with lateral row of several stout teeth, ventral margin with two stout teeth; maxillae strongly modified (Fig. 16). Eyes: PME 0.8 of their diameter apart, 0.7 of their diameter from PLE; AME half of their diameter apart. Clypeus length slightly less than 3 times diameter of AME. Legs: Dorsal tibial spines 2-2-2-2, tibiae in distal half with several (up to 4) trichobothria; Tm I 0.25-0.35 (holotype 0.32); Mt IV/Ta IV = c. 1.5; tibial spines nearly 1.5d, no lateral spines on Ti I-II. Palpal organ (Figs. 18-22): Cymbium modified with posterior lateral finger-like extension (Figs. 18, 22); embolus (Figs. 20, 21) of very complicated structure, sickle-like, distal edge of sperm-duct opening sclerotised into a kind of tooth, portion of embolus beyond this tooth broad, strongly bent, with serrated ectal edge and row of serrated teeth; lamella small, U-shaped (Fig. 19); terminal apophysis membranous.

Female: Total length 1.60-2.35, carapace length 0.72-0.78, width 0.52-0.58. Carapace brown-green

suffused with black; sternum black rugose, lighter in centre; legs as in male; pedipalp black except dorsal and ventral part of Pa and Fe; abdomen may vary from black to grey to creamy. Chelicerae normal, with three outer and two inner teeth. Maxillae normal. Eyes: Posteriors equidistant; PME 0.6 of their diameter apart and 0.6 from PLE; AME nearly half of their diameter apart. Clypeus length slightly more than one diameter of AME. Legs: Tm I 0.25-0.35; Mt IV/Ta IV = c. 1.4; tibial spines nearly 1.5d. Epigynum hardly visible as white elevation on epigynal fold; vulva as in Fig. 17.

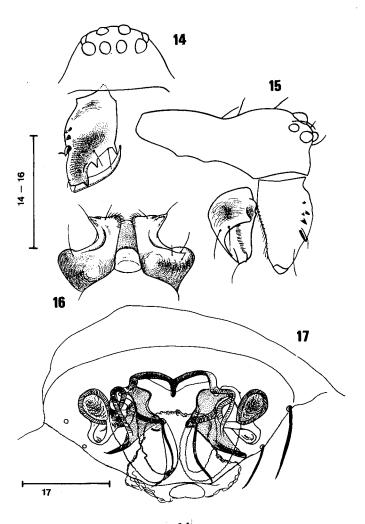
*Diagnosis:* The male is diagnosed by the form of the embolus and lamella, the female by the epigynum and vulva.

*Etymology:* The specific name refers to the preference of the species for the dry zones.

*Material examined* (paratypes): Baert & Maelfait, 1982: ISABELA: Beagle crater: western outer flank, alt. 20-250m, 22 Feb.  $(90^{\circ}0^{\circ}, 310^{\circ}0^{\circ}, 12^{\circ}0^{\circ})$ , 22-25 Feb.  $(70^{\circ}0^{\circ}, 120^{\circ}0^{\circ})$ ; crater lake, 24 Feb.  $(60^{\circ}0^{\circ}, 20^{\circ}0^{\circ})$ , Baert, Desender & Maelfait, 1988: ISABELA: Beagle crater, alt. 0-50m, 25 March  $(10^{\circ})$ .

For localities of non-typic material see Map 6.

Distribution: Fernandina, Isabela (Cerro Azul,



Figs. 14-17: *Meioneta arida* sp. n. 14 Male chelicera and head, frontal view; 15 Male carapace, chelicera and maxilla, lateral view; 16 Male maxillae and labium, ventral view; 17 Vulva, ventral view. Scale lines = 0.5 mm (14-16), 0.1 mm (17).

Volcán Alcedo, Volcán Darwin), Marchena, Santa Cruz and Santiago.

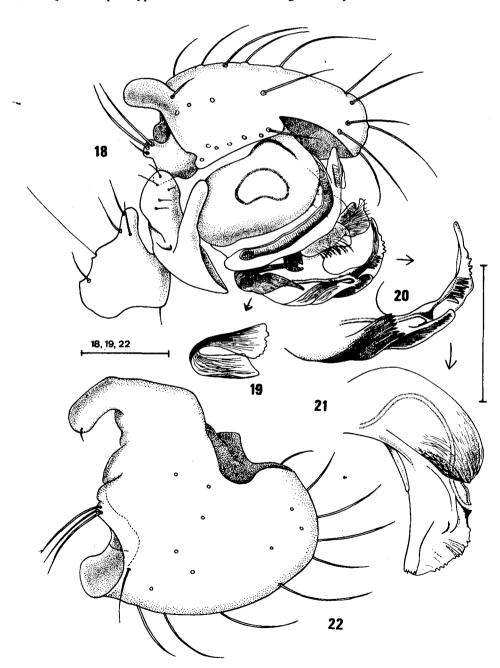
Zoogeographic affinities: Known only from the Galápagos.

*Habitat:* It is commonly found in the dry arid zone, in short grassy vegetation (*Coldenia* vegetation) and under stones (the floristic situation at the top of Cerro Azul is comparable with the coastal dry arid situation). It extends to an altitude of 900 m along the dry eastern slope of Volcán Alcedo. On Santiago it was also found in the vicinity of ponds at higher altitudes (500 and 600 m).

## Meioneta galapagosensis sp. n. (Figs. 23-27)

Holotype: Male holotype from Santa Cruz, Caseta Tortuga (alt. 150m), 20 March 1982. All types at KBIN, Brussels, except one paratype at Carleton University, Ottawa (Canada) (S. B. Peck).

Male: Total length 1.50-1.80 (holotype 1.62). Carapace length 0.63-0.77 (holotype 0.71), width 0.47-0.56 (holotype 0.53). Carapace shiny light brown with dark striae; sternum light brown, suffused with black, shiny; chelicerae yellowish, strongly suffused with black; legs orange-yellow; abdomen long oval, dorsum shiny creamy brown, strongly suffused with greyish black, posterior half with pattern of two short parallel longitudinal narrow creamy bars followed by narrow transverse creamy bar, venter smooth shiny light brown. Carapace normal. Chelicerae normal with 4 teeth on inner margin, posterior side with double row of warts (4 + 2). Eyes: Posteriors equidistant, all separated by half diameter of PME; anteriors nearly equidistant, separated by nearly half diameter of AME. Clypeus length nearly twice diameter of AME. Legs: Dorsal



Figs. 18-22: Meioneta arida sp. n. 18 Male palp, ectal view; 19 Lamella; 20 Embolus, ectal view; 21 Embolus, ventral view; 22 Cymbium, dorsal view. Scale lines = 0.1 mm.

tibial spines 2-2-2-2, tibiae with a few trichobothria in middle, no lateral spines on Ti I-II; Tm I 0.26-0.35 (holotype 0.31). Palpal organ (Figs. 23-24): Cymbium elevated in posterior half; embolus sickle-shaped, sperm-duct opening in a blunt finger-like extension; lamella bifid with barbed tips.

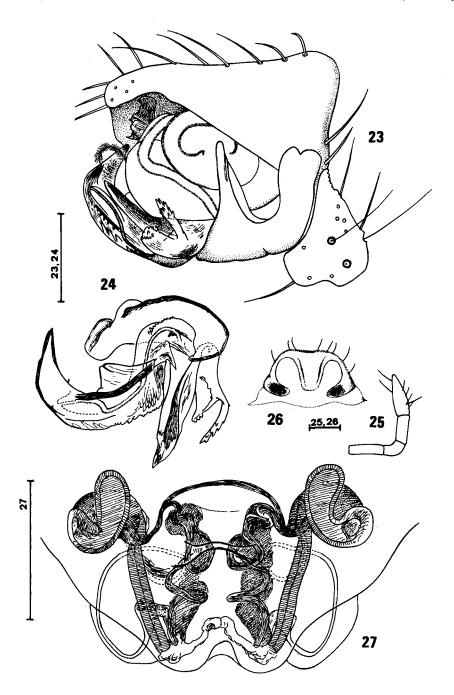
*Female:* Total length 1.54-2.00, carapace length 0.64-0.67, width 0.47-0.51. Carapace chestnut brown with irregular light brown patches; sternum dark to light brown; pedipalp with black Ta and Ti; legs orange-yellow with retro- and prolateral sides suffused with black; abdomen shiny black with slight greenish to coppery iridescence, caudum with variable white patch, venter shiny dark to light brown with creamy area around tracheal spiracle. Chelicerae with 3 to 4 teeth on outer margin, inner margin with 4 small teeth close

together, sometimes fused near base of fang. Eyes: Posteriors equidistant, separated by half diameter of PME; anteriors equidistant, separated by half diameter of AME. Clypeus length nearly twice diameter of AME. Legs: As male, Tm I 0.26-0.30. Epigynum and vulva as in Figs. 26, 27.

*Diagnosis:* The male is diagnosed by the form of the embolus and lamella, the female by the epigynum and vulva.

*Etymology:* The specific name refers to the Galápagos Islands.

*Material examined* (paratypes): Baert & Maelfait, 1982: SANTA CRUZ: Caseta Occidente, alt. 50m, 11 Feb. (3QQ), alt. 170m, 11 Feb. (1Q); Caseta Tortuga, alt. 150m, 20 March  $(8O^{*}O^{*}, 17QQ, 4j)$ ; El Chato, alt. 200m, 30 March  $(3O^{*}O^{*}, 2j)$ . Baert, Maelfait



Figs. 23-27: *Meioneta galapagosensis* sp. n. 23 Male palp, ectal view; 24 Embolic division, ventral view; 25 Female palp; 26 Epigynum, posterior view; 27 Vulva, ventral view. Scale lines = 0.1 mm.

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& Desender, 1986: SANTA CRUZ: Southern slope, alt. 50m, 1-12 March (1Q); alt. 140m, 15 March (1Q), 2saOO', 1saQ), 15 Feb.-1 March (2OO', 1Q, 1sa, 2j),1-12 March (90°0°, 1299, 1sa0°, 1sa9, 2j); alt. 230m, 15 Feb.-1 March  $(10^\circ, 29^\circ)$ , 1-12 March  $(1sa, 49^\circ)$ , 12-25 March (10); alt. 350m, 15 Feb.-1 March (20'0', 2QQ, j), 1-12 March (2QQ), 12-25 March (1Q); alt. 500m, 15 Feb.  $(10^{\circ})$ , 15 Feb.-1 March (299), 1-12 March (1Q), 12-25 March (2QQ); northern slope, alt. 500 m, 15 Feb. (1Q), 15 Feb.-1 March (3 $0^{\circ}0^{\circ}$ , 10 $Q^{\circ}Q$ ), 1-12 March  $(100^{\circ}0^{\circ}, 79^{\circ}9)$ , 12-25 March  $(60^{\circ}0^{\circ}, 79^{\circ}9)$ 2QQ; alt. 350m, 12-25 March (70°0°, 2QQ, 1sa0°); alt. 160m, 12-25 March (80°0°, 299); Media Luna trail, alt. 350m, 16 Feb. (10<sup>+</sup>, 699, 3j), 16-28 Feb.  $(40^{\circ}0^{\circ}, 2j)$ , 1-13 March  $(30^{\circ}0^{\circ}, 1^{\circ})$ ; alt. 520m (*Miconia*), 16-28 Feb.  $(10^{\circ}, 299)$ , 1-13 March (19); alt. 630m (fern-sedge), 1-13 March  $(20^{\circ}0^{\circ}, 19^{\circ})$ . Baert,

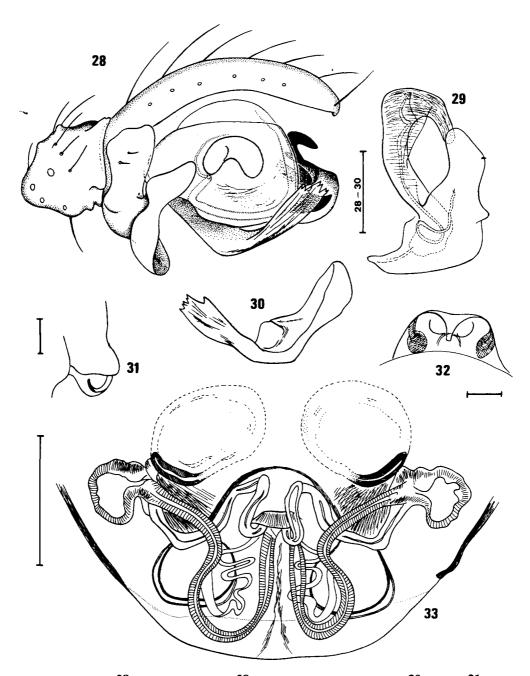
Desender & Maelfait, 1988: SANTA CRUZ: Northern slope, alt. 300m, 7 March  $(20^{\circ}0^{\circ})$ ; alt. 400m, 2 Apr.  $(40^{\circ}0^{\circ})$ . Jacquemart, 1974: SANTA CRUZ: Northern slope, 23 Jan. (2QQ). C.D.R.S. (Lubin, 1982): SANTA CRUZ: Caseta Tortuga, 22 Jan.  $(10^{\circ}, 1Q)$ . Schatz, 1985: SANTA CRUZ: Los Gemelos (*Scalesia*), alt. 630m, 16 Apr. (1Q). Peck, 1985: SANTA CRUZ: Media Luna, alt. 620m (*Miconia*), 16 Apr. (1Q).

For localities of non-typic material see Map 7.

Distribution: Isabela (Volcán Sierra Negra, Volcán Cerro Azul, Volcán Alcedo), San Cristóbal, Santa Cruz, Santiago.

Zoogeographic affinities: Known only from the Galápagos.

Habitat: This species occurs in all vegetation zones of Santa Cruz and San Cristóbal. It was found only along the southwestern slope of Santiago. It seems to



Figs. 28-33: *Meioneta albomaculata* sp. n. **28** Male palp, ectal view; **29** Embolus and radix, ventral view; **30** Lamella; **31** Epigynum, lateral view; **32** Epigynum, posterior view; **33** Vulva, ventral view. Scale lines = 0.1 mm.

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be restricted to the higher vegetation zones of the southern Isabela volcanoes (also in the culture zone near Santo Tómas on Volcán Sierra Negra).

# Meioneta albomaculata sp. n. (Figs. 28-33)

Holotype: Female holotype from Isla Isabela, Volcán Wolf, alt. 1425 m, 23 March 1988. All specimens mentioned in "Material examined" are paratypes. All types at KBIN, Brussels.

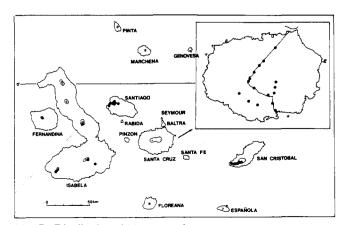
*Male:* Total length c. 1.47. Carapace length 0.72, width 0.58. Carapace chestnut brown with yellow-brown tinge dorsally, edged with black. Sternum brown-black. Legs yellow-brown with brown tibiae. Abdomen black. Chelicerae with three outer teeth. Eyes: Posteriors equidistant, 0.7 of diameter of PME apart; anteriors equidistant, 0.4 of diameter of AME apart. Clypeus nearly 2.5 times diameter of AME. Legs: Dorsal tibial spines 2-2-2-2; Tm I nearly 0.20; Mt IV/Ta IV nearly 1.5; tibial spines slightly more than 2d, no lateral spines on Ti I-II. Palpal organ (Figs. 28-30): Embolus strongly bent, not flat as in previous species but rounded as a hook (Fig. 29); sperm-duct ends in a tooth-like extension; lamella large and serrated at apex (Fig. 30); cymbium unmodified.

*Female:* Total length 1.43-1.79 (holotype 1.60). Carapace length 0.62-0.69 (holotype 0.66), width 0.49-0.51 (holotype 0.49). Carapace more yellow-brown than in male, edges black. Legs yellow-brown. Abdomen dorsally grey and ventrally black, with caudal variable white spot. Chelicerae as in male but more robust. Eyes: Posteriors equidistant, separated by half diameter of PME; AME small; anteriors equidistant, separated by diameter of AME. Clypeus nearly 2.5 times diameter of AME. Legs: Dorsal tibial spines 2-2-2-2; Tm I 0.24-0.26 (holotype 0.23); Mt IV/Ta IV nearly 1.5; tibial spines more than 3d. Epigynum and vulva as in Figs. 31-33.

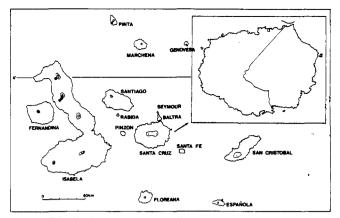
*Etymology:* The specific name refers to the white abdominal spot in females.

*Diagnosis:* The male is diagnosed by the form of the embolus and lamella, the female by the epigynum and vulva.

Material examined (paratypes): Baert, Desender & Maelfait, 1988: ISABELA: Volcán Darwin, alt. 800m, 26 March  $(1^{\circ})$ ; alt. 1000m, 27 March  $(1^{\circ})$ ; alt. 1200m,



Map 7: Distribution of Meioneta galapagosensis sp. n.



Map 8: Distribution of *Meioneta albomaculata* sp. n. (Isla Isabela) and *Meioneta pinta* sp. n. (Isla Pinta).

lava tunnel, 27 March (2♀); alt. 1300 m, 28 March (1♂). Distribution: Isabela (Volcán Darwin and Volcán Wolf) (see Map 8).

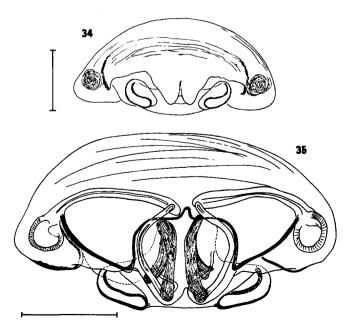
Habitat: Higher top zone of the northern Isabela volcanoes (Darwin and Wolf).

Zoogeographic affinities: Known only from the Galápagos.

## Meioneta pinta sp. n. (Figs. 34-35)

Holotype: Female holotype from Isla Pinta, western coast, alt. 200m, 23 March 1986. Type at KBIN, Brussels.

*Female* (male unknown): Total length 1.49. Carapace length 0.63, width 0.50. Carapace and chelicerae grey with tinge of green and suffused with black, edges black; eye region black; sternum very dark (brown with tinge of green); legs (only Fe and Pa left) much lighter than carapace; pedipalp with Ti and Mt strongly suffused with black; abdomen grey with numerous small yellowish patches, giving appearance of longitudinal



Figs. 34-35: *Meioneta pinta* sp. n. **34** Epigynum, ventral view; **35** Vulva, ventral view. Scale lines = 0.1 mm.

grey stripes alternating with yellow ones. Chelicerae with three teeth. Eyes: Posteriors equidistant, PME half their diameter apart; anteriors equidistant, AME nearly half their diameter apart. Clypeus length nearly twice diameter of AME. Epigynum and vulva as in Figs. 34 and 35.

*Diagnosis:* The female is diagnosed by the epigynum and vulva.

*Etymology:* The specific name is a noun in apposition taken from the type locality.

Distribution: Pinta (see Map 8).

Zoogeographical affinities: Known only from the Galápagos.

### Acknowledgements

Our investigations were made possible by the financial support of (1) the Belgian Ministry of Education, (2) the National Foundation for Scientific Research (NFWO) and (3) the Léopold III Foundation. We are very grateful to these institutions. We received excellent co-operation from the CDRS (Director Günther Reck and his staff) and the National Park Service of the Galápagos (Ir. Miguel Cifuentes, Ir. Humberto Ochoa and Lcdo Fausto Cepeda). We also thank Misses Sonja Sandoval, Sandra Abedrabbo and M. Galarza of the Universidad Católica de Quito for their valuable help in the field. My further thanks go to J. W. Pulawski (Californian Academy of Science - CAS), M. Wilson (CDRS), H. Schatz and S. Peck for the loan of their sampled material, P. Hillyard (BMNH) for the loan of type material, A. F. Millidge for his critical reading of the manuscript, Miss K. Bouckaert for the final drawings and P. Chevalier for drawing the maps.

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