

New data on the Neuroptera of the Galápagos Islands, Ecuador

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Abstract:

All species described and/or recorded from the Galápagos Islands by KLIMASZEWSKI et al. (1987) have been caught in the course of the last five years by two teams studying the invertebrate fauna of the Galápagos Archipelago. All data collected in that period of time are compiled. Data are given for eight Neuroptera species, including one previously unknown species. New island records are given for many species, which completes our knowledge on their distribution. Details are given on the evening flight activity of *Brachynemurus darwini*.

Résumé:

Toutes les espèces décrites et/ou mentionnées des îles Galápagos jusqu'à l'ouvrage de KLIMASZEWSKI et al. (1987) ont été capturées durant les cinq dernières années par deux groupes de recherche étudiant la faune des invertébrés de l'archipel. Les données réunies durant cette période pour 8 espèces de névroptères, dont une espèce non connue jusqu'à ce jour, sont énumérées. La majorité des espèces sont citées pour la première fois pour certaines îles. Des détails sont donnés au sujet de l'activité de vol d'une espèce, *Brachynemurus darwini*.

Introduction

A detailed checklist of species of Neuroptera described and (or) recorded from the Galápagos Islands, supplemented with a review of all published records, and a key for identification has been presented by KLIMASZEWSKI et al. (1987). In this paper we update this knowledge with new records made in the course of expeditions to Galápagos in 1986, 1988, 1991 (L. BAERT, K. DESENDER, J.-P. MAELFAIT) and 1989, (S. PECK, B. LANDRY, J.B. SINCLAIR), 1991* (S. PECK, J. HERATY and Cl. VOGEL). The sampling methods used included a Petromax light trap (1986, 1988), Flight Intercept Traps, Malaise traps, and an UV-light trap (1989, 1991). We give for each species its original name and author, recent literature references, and our distribution data ordered according to island, locality, elevation and vegetation zone.

The islands indicated with an asterix are new locality records. Finally we summarize our knowledge on the dis-

tribution of each species. Details are given on the flight activity of *Brachynemurus darwini*, a species caught in high numbers on one occasion.

Specimens are deposited in the collections of the Koninklijk Belgisch Instituut voor Natuurwetenschappen, The Carlton University, the Charles Darwin Research Station, the National Museum of Ecuador and the Entomology collections of the Pontificia Universidad católica del Ecuador, Quito.

FAMILY MYRMELEONTIDAE

Brachynemurus darwini STANGE, 1969

Brachynemurus darwini STANGE, 1969: 190; PARKIN et al., 1972: 103; KLIMASZEWSKI et al., 1987: 3033.

New records:

BALTRA: Arid zone, *Bursera* forest, alt. 30m, 24 January 1989 (5 specimens). **FERNANDINA:** 5km NE of Cabo Hammond (Cerro Verde), alt. 110m, 4-10 May 1991* (15 specimens). **MARCHENA:** Playa Negra, beach, 10 March 1988 (17♂♂, 25♀♀), 11 March 1988 (133♂♂, 107♀♀). **PINTA:** Cabo Ibbetson, coastal arid zone, 19 March 1986 (1♂, 11♀♀), 21 March 1986 (8♂♂, 15♀♀), 22 March 1986 (1♂, 4♀♀). **SANTA CRUZ:** Barranco near CDRS, alt. 40m, 1-30 May 1991* (1 specimen); Bahía Tortuga, alt. 2m, 15 May 1991* (1 specimen). **SEYMOUR NORTE:** Arid zone, 23 January 1989 (1 specimen), 24 January 1989 (4 specimens).

Distribution:

Endemic to the archipelago: Baltra*, Española, Fernandina*, Floreana, Isabela, Marchena*, Pinta, Pinzón, Santiago, Santa Cruz, Santa Fé and Seymour Norte*.

Typical to the arid zone.

Flight activity:

The detailed flight activity of this species was recorded on Isla Marchena during a calm evening (March 11, 1988) by means of a Petromax light trap (Fig. 1).

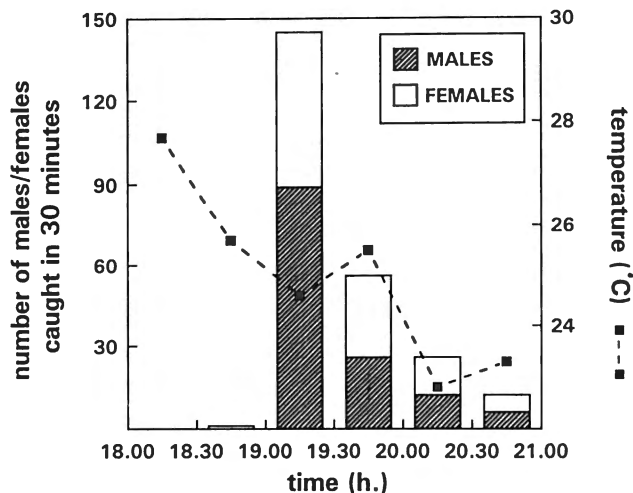


Figure 1. — Observed flight activity of *Brachynemurus darwini* in relation to the air temperature during sampling (by mean of Petromax light trap) conducted from 18h00 to 21h00. Sunset was at 18h00.

The highest activity was about one hour and 30 minutes after sunset, with males predominating. Later there was a decrease in the numbers caught, but with a more equal sex ratio. The flight activity seemed to begin only when the temperature dropped below 26°C. Temperatures below 24°C also seemed to inhibit flight activity.

Myrmeleon perpilosus BANKS, 1924

Myrmeleon perpilosus BANKS, 1924: 177; STANGE, 1969: 196; PARKIN et al., 1972: 102; KLIMASZEWSKI et al., 1987: 3033, 3039.

New records:

BALTRA: Arid zone, *Bursera* forest, alt. 30m, 24 January 1989 (2 specimens). **FERNANDINA:** Punta Espinosa, beach, 24 March 1988 (1 ♀); Cabo Hammond, littoral zone, 4-11 May 1991* (1 specimen); 5km NE of Cabo Hammond (Cerro Verde), alt. 110m, 4-10 May 1991 (1 specimen). **FLOREANA:** Black beach, coastal arid zone, alt. 10m, 21-28 March 1989 (2 specimens). 3km E of Black beach, arid zone, alt. 120m, 21-28 March 1989 (3 specimens). 5km E of Black beach, transition zone, alt. 250m, 22-28 March 1989 (1 specimen). 6km E of Black beach, *Scalesia* forest, alt. 380m, 21-28 March 1989 (4 specimens); Pta Cormoran, alt. 5m, 21-22 April 1991 (3 specimens). **GENOVESA:** Bahía Darwin, beach, 13 March 1988 (1 ♀). **ISABELA:** Volcán Sierra Negra: Villamil, coastal arid zone, 0-5m, 2-15 March 1989 (16 specimens). 1km W of Villamil, littoral scrub on sand, alt. 1m, 2-15 March 1989 (38 specimens). 2km W of Villamil, brackish meadow, alt. 2m, 2-15 March 1989 (5 specimens). 4km W of Villamil, arid forest, alt. 20m, 2-15 March 1989 (29 specimens). 12km NW of Villamil, transition forest, alt. 150m, 2-15 March 1989 (10 specimens).

Santo Tomás, humid forest, alt. 300m, 4-15 March 1989 (1 specimen). Puerto Villamil, laguna, 29 March 1988 (1 ♀). **Volcán Darwin:** alt. 800m, 26 March 1988 (1 ♀). **Volcán Cerro Azul:** Caleta Iguana, 19-25 May 1991* (1 specimen). **Volcán Alcedo:** NE of tourist landing site, arid zone, 20-26 June 1991* (3 specimens). **MARCHENA:** Playa Negra, beach, 10-11 March 1988 (1 ♂, 2 ♀ ♀), 11 March 1988 (1 ♂, 7 ♀ ♀). **PINTA:** Cabo Ibbetson, coastal arid zone, 21-22 March 1986 (1 ♂, 1 ♀). **RABIDA:** NE coast, alt. 250m, 2-11 June 1991* (4 specimens). **SANTIAGO:** Playa Espumila, laguna, 19 March 1988 (1 ♀); 3-9 June 1991* (1 specimen). **SAN CRISTOBAL:** Puerto Baquerizo Moreno, arid zone, alt. 10m, 11-23 February 1989 (3 specimens). 3km E of Puerto Baquerizo, alt. 100m, 12-23 February 1989 (1 specimen). **SANTA CRUZ:** C.D.R.S., arid zone, littoral zone, 1-14 June 1991* (1 specimen); alt. 2m, 7 April 1991 (1 specimen); alt. 10m, 22-31 January 1989 (9 specimens), 1-28 February 1989 (12 specimens), 1-30 March 1989 (10 specimens), 1-8 April 1989 (10 specimens); alt. 20m, 14 May - 3 July 1991* (5 specimens); alt. 40m, 1 May - 30 June 1991* (9 specimens). C.D.R.S., coastal arid zone, 1 March 1986 (2 ♂ ♂, 1 ♀), 2 March 1986 (1 ♀), 11 March 1986 (3 ♀ ♀), 16 March 1986 (4 ♀ ♀), 29 March (3 ♀ ♀), 17 March 1988 (1 ♀). Bahía Tortuga, littoral zone, 14 March 1986 (1 ♂), 15-28 April 1991 (1 specimen). Playa Bachas, beach, 15 March 1988 (1 ♀). Santa Rosa, Tortoise reserve, transition forest, alt. 180m, 7 February 1989 (1 specimen). 1.2km N of Sta Rosa, alt. 600m, 1-30 May 1991* (1 specimen). **SANTA FE:** beach, alt. 5m, 24-25 April 1991 (1 specimen).

Distribution:

On the continental American mainland from Mexico to Perú. Native to Galápagos: Baltra*, Española, Fernandina*, Floreana*, Genovesa*, Isabela (Sierra Negra, Wolf, Cerro Azul and Alcedo)*, Marchena*, Pinta*, Pinzón, Rabida*, San Cristóbal*, Santa Cruz (type locality at Conway Bay), Santa Fe, Santiago* and Wenman.

Found from the arid zone up to the *Scalesia* zone.

FAMILY CHRYSOPIDAE

Chrysoperla galapagoensis (BANKS, 1924)

Chrysopa galapagoensis BANKS, 1924: 179; PARKIN et al., 1972: 102. KLIMASZEWSKI et al., 1987: 3033.

Chrysoperla galapagoensis (BANKS, 1924): BROOKS & BARNARD, 1990: 271.

New records:

FERNANDINA: 5km NE of Cabo Hammond (Cerro Verde), alt. ca 120m, 4-11 May 1991* (2 specimens). alt. 400m, 6 May 1991 (1 specimen). 15 km NE of Cabo Hammond, alt. 1000m, 1 May 1991* (1 specimen). **FLOREANA:** 3km E of Black beach, arid zone, alt. 120m; 21-28 March 1989 (2 specimens). 5km E of Black

beach, transition zone, alt. 250m, 22-28 March 1989 (1 specimen). **ISABELA: Volcán Cerro Azul:** Caleta Iguana, alt. 10m, 19 May 1991 (2 specimens). 2km NE of Caleta Iguana, alt. 155m, 21-25 May 1991* (1 specimen). 15km NE of Caleta Iguana, alt. 1500m, 21 May 1991* (1 specimen). **Volcán Alcedo:** Along tourist trail, alt. 600m, 23,25 June 1991* (3 specimens). NE rim of caldera, alt. 1100m, 21-25 May 1991* (28 specimens). **PINZON:** 5km W of Playa Escondida, alt. 200m, 19 June 1991* (1 specimen). **RABIDA:** NE coast, alt. 100m, 10 June 1991* (3 specimens); alt. 250m, 2 June 1991* (1 specimen). **SANTA CRUZ:** CDRS near Barranco, alt. 40m, 1 May - 30 June 1991* (2 specimens). Puerto Ayora village, alt. 5m, 11 June 1991* (1 specimen). El Granillo, alt ca 300m, 11 May 1991* (5 specimens), 15 June 1991 (1 specimen). Near Bellavista, alt 115m, 01-30 March 1989 (1 specimen). 1.2km N of Sta Rosa, alt. 600m, 1-30 June 1991* (4 specimens). Media Luna, *Miconia* zone, alt. 550m, 01-30 March 1989 (1 specimen). **SANTIAGO:** Aguacate camp, alt. 550m, 4-9 June 1991* (2 specimens). 1km NE of Aguacate camp, alt. 600m, 4-9 June 1991* (1 specimen).

Distribution:

Endemic to the archipelago; Baltra, Fernandina*, Floreana, Isabela (Cerro Azul and Alcedo)*, Pinzon*, Rabida*, Santiago and Santa Cruz. Found in the coastal arid zone, the transition and the *Miconia* zones.

Neosuarius nigripilosa (BANKS, 1924)

Chrysopa nigripilosa BANKS, 1924: 177; PARKIN et al., 1972: 102; KLIMASZEWSKI et al., 1987: 3033.

Neosuarius nigripilosa (BANKS, 1924): BROOKS & BARNARD, 1990: 272.

New records:

BALTRA: Arid zone, *Bursera* forest with grass under-cover, alt. 30m, 24 January 1989 (14 specimens). **FERNANDINA:** Cabo Hammond, alt. 5m, 12 May 1991 (5 specimens). 5km NE of Cabo Hammond (Cerro Verde), alt. 110m, 4-10 May 1991 (2 specimens). alt. 400m, 4 May 1991 (1 specimen). **ISABELA: V.Sierra Negra:** Villamil, alt. 0-5m, 02-15 March 1989 (5 specimens). **V.Wolf:** beach, 20 March 1988 (7 specimens), 23 March 1988 (18 specimens). **V.Darwin:** Beagle crater, beach, 25 March 1988 (8 specimens). **V.Alcedo:** Near landing beach, 20-26 June 1991* (3 specimens). NE rim, alt. 1100m, 21-25 June 1991* (3 specimens). **RABIDA:** NE coast, alt. 10m, 10 June 1991* (1 specimen). **SANTA CRUZ:** CDRS, arid zone, 05-09 February 1989 (1 specimen). **SANTA FE:** beach at bahía, alt. 5m, 24-25 April 1991 (1 specimen). **SEYMOUR NORTE:** Arid zone, *Bursera* forest, alt. 10m, 23 January 1989 (15 specimens).

Distribution:

Endemic to the archipelago; Baltra, Fernandina*, Isabela

(Darwin, Alcedo, Sierra Negra and Wolf)*, Rabida*, Santa Fe*, Santiago, Santa Cruz and Seymour Norte*. Typical of the arid zone.

Ceraeochrysa cincta (SCHNEIDER, 1851)

Chrysopa wollebaeki ESBEN-PETERSEN, 1934: 291; KLIMASZEWSKI et al., 1987: 3033, 3034.

Ceraeochrysa cincta (SCHNEIDER, 1851): BROOKS & BARNARD, 1990: 268.

New records:

FERNANDINA: Punta Espinosa, beach, 24 March 1988 (1 specimen). **ISABELA: V.Sierra Negra:** Villamil, Littoral zone, alt. 0-5m, 02-15 March 1989 (2 specimens). 1km W of Villamil, littoral scrub on sand, 02-15 March 1989 (6 specimens). 2km W of Villamil, brackish meadow, alt. 2m, 02-15 March 1989 (1 specimen). 4km NW of Villamil, arid forest, alt. 20m, 02-15 March 1989 (2 specimens). 11km N of Villamil, 9 March 1989 (1 specimen). 12 km NW of Villamil, transition forest, alt. 150m, 02-15 March 1989 (3 specimens). Santo Tomás, humid forest, alt. 300m, 04-15 March 1989 (3 specimens). **V. Cerro Azul:** alt. 50m, 23 May 1991 (1 specimen). 2km NE of Caleta Iguana, alt. 150m, 19-25 May 1991* (1 specimen), 25 May 1991 (1 specimen). **V. Alcedo:** NE rim, alt. 1100m, 21-25 June 1991* (1 specimen). **SAN CRISTOBAL:** arid zone, (1 specimen). Pampa between 500 and 700m, 15-23 February (2 specimens). Cerro Mundo, guava thicket, alt. 550m, 13-23 February 1989 (1 specimen). **SANTA CRUZ:** CDRS, 1 March 1986 (1 specimen), 29 March 1986 (4 specimens), 16 January 1989 (2 specimens). Bahía Tortuga, littoral zone, 6-15 April 1991 (1 specimen). 2km W of Bellavista, 27 February 1989 (1 specimen). Culture zone, 200m, 01-09 April 1989 (1 specimen). Media Luna, *Miconia* zone, alt. 500m, 01-29 February 1989 (1 specimen).

Distribution:

Endemic to the archipelago: Fernandina*, Floreana, Isabela (Cerro Azul, Alcedo and Sierra Negra)*, San Cristóbal* and Santa Cruz.

Found from the arid zone up to the pampa zone.

Chrysopa new species

New records:

ISABELA: V.Sierra Negra: 2km W of Villamil, 5 March 1989 (1 specimen). **SANTA CRUZ:** CDRS, 17 January 1989 (1 specimen), 02 March 1989 (1 specimen); alt. 10m, 29-31 May 1991* (1 specimen).

Distribution:

Endemic to the archipelago; Isabela (Sierra Negra) and Santa Cruz.

Typical for the arid zone.

FAMILY HEMEROBIIDAE

Megalomus darwini BANKS, 1924

Megalomus darwini BANKS, 1924: 179; PARKIN et al., 1972: 102; KLIMASZEWSKI et al., 1987: 3035.

New records:

FERNANDINA: Cabo Hammond, alt. 5m, 12-13 May 1991 (3 specimens); Cerro Verde, alt. 170m, 9 May 1991 (34 specimens). 5km NE of Cabo Hammond, alt. 110m, 4-10 May 1991* (22 specimens). 18km NE of Cabo Hammond, alt. 1350m, 8 May 1991* (2 specimens). **ISABELA:** V.Sierra Negra: Villamil, 02 March 1989 (1 specimen). 1km W of Villamil, littoral scrub on sand, 02-15 March 1989 (1 specimen). 8.5km N of Villamil, 11 March 1989 (1 specimen). **V. Cerro Azul:** alt. 1200m, 23 May 1991 (1 specimen). **V. Alcedo:** Along tourist trail: beach, 20-26 June 1991* (2 specimens); alt. 200m, 25 June 1991* (1 specimen); alt. 600m, 25 June 1991* (1 specimen); alt. 1000m, 21 June 1991* (1 specimen), alt. 1100m, 21-25 June 1991* (2 specimens). **RABIDA:** NE coast, alt. 40m, 2-11 June 1991* (3 specimens); alt. 250m, 2 June 1991* (1 specimen). **SAN CRISTOBAL:** 4km SE of Baquerizo, 20 February 1989 (1 specimen). **SANTIAGO:** Playa Espumila, alt. 2m, 3-10 June 1991* (8 specimens). Aguacate camp, alt. 550m, 4-9 June 1991* (5 specimens). **SANTA CRUZ:** C.D.R.S., 29 March 1986 (3♂♂, 11♀♀); 16 January 1989 (12 specimens); 17-30 March 1989 (7 specimens); 1 July 1991* (1 specimen). C.D.R.S., alt. 10m, 01-28 February 1989 (11 specimen); 01-30 March 1989 (5 specimens); 01-08 April 1989 (6 specimens). C.D.R.S., alt. 5-30m, 01-10 April 1989 (5 specimens). C.D.R.S. near barranco, alt. 40m, 1-30 June 1991* (2 specimens). 1km E of C.D.R.S., lagoon, 30 March - 07 April 1989 (1 specimen). Salt lagoon 2km W of CDRS, alt. 1m, 1 May 1991* (1 specimen). Tortuga Bay, Littoral zone, 29 January 1989 (1 specimen). Finca S. DEVINE, 17 March 1989 (1 specimen). Culture zone, 01-09 April 1989 (2 specimens). Los Gemelos, alt. 600m, *Scalesia* forest, 01-30 March 1989 (1 specimen). 7.2km N of Sta Rosa, alt. 600m, 1-30 June 1991* (3 specimens). 9km N of Los Gemelos, alt. 330m, 17 May 1991* (2 specimens). **SEYMOUR:** Arid zone, 23 January 1989 (1 specimen).

Distribution:

Endemic to the archipelago; Fernandina*, Isabela (Cerro Azul, Alcedo and Sierra Negra)*, Rabida*, Santiago*, San Cristóbal*, Santa Cruz and Seymour Norte*. Typical for the arid zone (one single capture in the *Scalesia* forest near Los Gemelos, Santa Cruz).

Symphorobius barberi (BANKS, 1903)

Hemerobius barberi BANKS, 1903: 241.

Symphorobius barberi: KLIMASZEWSKI et al., 1987: 3033, 3035; OSWALD, 1988: 427.

New records:

FERNANDINA: 5km NE of Cabo Hammond (Cerro Verde), alt. 110m, 4-10 May 1991* (5 specimens). Cerro Verde, alt. 170m, 9 May 1991 (4 specimens). **ISABELA:** **V.Sierra Negra:** 1km W of Villamil, 05 March 1989 (1 specimen). 2km W of Villamil, 03 March 1989 (1 specimen). **V.Cerro Azul:** Caleta Iguana, alt. 10m, 19 May 1991 (7 specimens), 22 May 1991 (15 specimens). 2km NE of Caleta Iguana, alt. 155m, 19-25 Mayo 1991* (1 specimen). alt. 1200m, 23 May 1991 (2 specimens). **V. Alcedo:** tourist landing site, 26 June 1991* (2 specimens). **RABIDA:** NE coast, alt. 100m, 10 June 1991* (1 specimen); alt. 250m, 2 June 1991* (1 specimen). **SANTA CRUZ:** C.D.R.S., 17 January 1989 (1 specimen); 05-09 February 1989 (1 specimen). C.D.R.S., alt. 10m, 01-28 February 1989 (1 specimen); 01-30 March 1989 (1 specimen). Finca S. DEVINE, 17 March 1989 (1 specimen). Culture zone, 01-09 April 1989 (2 specimens). 2km W of Bellavista, 27 February 1989 (1 specimen). 1km N of Puerto Ayora, alt. 50m, 15 June 1991* (1 specimen). 6km N of Los Gemelos, alt. 300m, 17 May 1991* (2 specimens). El Granillo, 9km N of Los Gemelos, alt. 300m, 15 June 1991 (9 specimens). Los Gemelos, alt. 570m, 17 May 1991* (1 specimen). **SANTIAGO:** Playa Espumila, alt. 2m, 3-10 June 1991* (2 specimens). **SEYMOUR:** Arid zone, *Bursera* forest, alt. 10m, 23 January 1989 (1 specimen).

Distribution:

From the American mainland (southern and eastern USA) south to Perú; Hawaiian Islands (introduced), Revillagigedo Island; native to the Galápagos archipelago on Fernandina*, Isabela (Cerro Azul, Alcedo, Sierra Negra)*, Rábida, Santa Cruz, Santiago and Seymour Norte*.

Found in the arid and culture zones.

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