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A SYNOPSIS OF THE PATAGONIAN SPECIES OF THE GENUS *AESHNA* FABRICIUS (ANISOPTERA: AESHNIDAE)

N. VON ELLENRIEDER
Instituto de Limnología "Dr. Raúl A. Ringuelet"
C.C. 712, 1900 La Plata, Argentina
e-mail: ellenr@ilpla.edu.ar

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This synopsis includes diagnoses for adults, a key for ♂♂ and ♀♀, illustrations of taxonomic characters and updated distribution data for each sp. The ventral terga contour is found to vary interspecifically allowing identification of all species. Other useful characters are the presence or absence of black stripes over frontoclypeal and fronto-ocular grooves, abdominal colour pattern and shape of the cerci. Some colour characters of *A. variegata* vary geographically and two forms are described: a dark (humid biomes) and light form (dry biomes). The synonymy of *A. peralta* and *A. variegata* is considered doubtful.

INTRODUCTION

The genus *Aeshna* Fabricius, is distributed worldwide and comprises more than 50 species (DAVIES & TOBIN, 1985). From Patagonia, the southern portion of South America, 35 species of Odonata have been recorded, seven belonging to the genus *Aeshna*: *A. variegata* Fabricius, *A. peralta* Ris, *A. confusa* Rambur, *A. bonariensis* Rambur, *A. diffinis* Rambur, *A. absoluta* Calvert and *A. elsia* Calvert (CALVERT, 1956; JURZITZA, 1989, 1990a; 1990b; MUZON, 1995, 1997; RODRIGUES CAPÍTULO & MUZÓN, 1989a). Species of *Aeshna* are often the most common, conspicuous odonates in Patagonia, and they inhabit almost all types of lentic environments (MUZÓN, 1995).

Even with use of the available literature, proper identification of Patagonian *Aeshna* species is often difficult or impossible because most of the original descriptions are too vague and the only comprehensive revision including all Patagonian species (CALVERT, 1956) is based partly on erroneous identifications and uses characters intraspecifically variable in the diagnoses and keys. JURZITZA

(1990a) made the attempt to disentangle the taxonomic confusion, and although I confirmed most of his conclusions, his diagnostic characters to separate *A. diffinis* from *A. absoluta* are intraspecifically variable.

STUDY AREA

Patagonia comprises the cold temperate region of South America situated from the 35°S in Chile and the Colorado River in Argentina (39°S), to Tierra del Fuego and neighbouring islands (55° S) (SORIANO et al., 1983). Rainfall is highest in the Andes (2000 mm/year), averages 125 mm/yr in the central-West and 500 mm in the West; most precipitation occurs in the coldest months (PARUELO et al., 1998). The climatic heterogeneity of Patagonia is the result of combined influence of the latitudinal temperature gradients and East-West rainfall gradient. The decrease of rainfall from east to west determines a gradient of vegetation types: forest, grassland steppe, shrub-grassland steppe, shrub steppe and semidesert (SORIANO et al., 1983).

Biogeographically, Patagonia comprises three subregions (MORRONE, 1999): Subantarctic, with forests dominated by the tree genus *Nothofagus* in the West (Andean region), Patagonian, with grassland steppes, shrub steppes and semideserts on the centre and East (Andean region), and part of the Chaqueñan, with shrub steppes of *Larrea* sp. on the North-East (southern portion of Monte province, Neotropical region).

MATERIAL AND METHODS

Specimens from many different localities were examined in order to encompass the entire range of intraspecific variability. Except for collections from Patagonia, full locality data under material examined are not included due to the large number of specimens studied, and the distribution is given by departments or provinces for each country. Variability listed as percentages in the diagnoses and key include total number of specimens of each species examined: *A. absoluta*, 246 ♂, 172 ♀; *A. bonariensis*, 139 ♂, 123 ♀; *A. diffinis*, 325 ♂, 249 ♀; *A. confusa*, 58 ♂, 57 ♀; *A. variegata* 404 ♂, 133 ♀. Rainfall data were taken from IGM (1994). Wing venation terminology follows RIEK & KUKALOVÁ-PECK (1984), that of abdominal colour pattern is after WALKER (1912).

The following characters are used in discriminating among species: H e a d: – Contour of T-spot of frons; presence or absence of black stripe over frontoclypeal and fronto-ocular grooves. T h o r a x: – Extension and contour of pale mesanepisternal, mesepimeral and metepimeral stripes (relatively stable in *A. variegata* and *A. confusa*), colour and width of stripes ontogenetically variable; colour of wing membranule, pterostigma and veins. A b d o m e n: – Pattern of pale and black spots; contour of ventral terga as delimited by the inner and outer lateroventral longitudinal and posteroventral transverse carinae. Cerci: Female cerci normally lanceolate with mediolongitudinal dorsal carina and with acute or rounded tips. Male cerci with outer margin straight and with dorsolongitudinal carina between distal 0.25-0.20; the contour of inner margin is characteristic for each species. Sub-basal tooth of male cercus poorly to well developed.

Material examined is deposited in the following collections:

- ANSP: The Academy of Natural Sciences, Philadelphia, PA, USA
- FML: Fundación Miguel Lillo, Tucumán, Argentina
- IADIZA: Instituto de Investigaciones de Zonas Áridas, Mendoza, Argentina
- IEUM: Instituto de Entomología, Universidad Metropolitana de Ciencias de la Educación, Chile
- MACN: Museo Argentino de Ciencias Naturales Bernandino Rivadavia, Buenos Aires, Argentina
- MHNS: Museo Nacional de Historia Natural, Santiago, Chile
- MLP: Departamento Científico de Entomología, Museo de La Plata, Buenos Aires, Argentina
- PDA: Vicente Pérez D'Angello collection, Instituto de la Patagonia, Magallanes, Chile
- UMMZ: University of Michigan, Museum of Zoology, MI, USA
- USNM: United States National Museum, Washington, D.C., USA

– ZMH: Zoologisches Institut und Zoologisches Museum der Universität Hamburg, Germany

KEY TO THE PATAGONIAN SPECIES OF *AESHNA* FABRICIUS

1 Black stripe over frontoclypeal groove (as in Fig. 7); male cerci black or dark reddish brown; wing membranule black but basal 0.20-0.25 white 2
– No black stripe over frontoclypeal groove (as in Fig. 8); base of male cerci with an outer pale spot (Figs 52, 54); wing membranule black but basal 0.15 white 4
2 Female abdominal segment II dorsally with a mediolongitudinal black stripe from transverse carina to posterior margin (Fig. 30); female cerci tips acute (Fig. 61); basal 0.30 of male inner lateroventral carina of abdominal tergum IV concave (Fig. 41) ..... ***absoluta***
– Female abdominal segment II dorsally without a mediolongitudinal black stripe from transverse carina to posterior margin (Figs 31-36); female cerci tips rounded (Figs 63, 65); male inner lateroventral carina of abdominal tergum IV straight (Figs 43, 45) 3
3 Supratriangle generally free (93%); female cerci length 3.4-4.3 mm; basal 0.30 of male cerci gradually widening, then inner and outer margins almost parallel (Fig. 58); PL and PD confluent on segments IV--VII (Fig. 26); abdominal ventral terga as in Figs 43, 48 ..... ***diffinis***
– Supratriangle always crossed; female cerci length 4.3-5.5 mm; basal 0.40 of male cerci inner margin gradually widening, distal 0.50 concave (Fig. 60); when present, PL separated from PD by a black stripe on segments IV-VII of the male (Figs 28-29); abdominal ventral terga as in Figs 45, 50 ..... ***variegata***
4 Black stripe over fronto-ocular groove widening towards frontoclypeal groove in lateral view (as in Fig. 7); mesanepisternal pale stripes always complete; supratriangle always crossed; female cerci as in Fig. 64; male cerci with sub-basal tooth slightly developed, inner margin ventrally bent between distal 0.30-0.50 (Fig. 54) ..... ***confusa***
– Black stripe over fronto-ocular groove of uniform width in lateral view (Fig. 8); mesanepisternal pale stripes incomplete or absent; supratriangle generally free (95%); female cerci as in Fig. 62; male cerci with sub-basal tooth well developed, inner margin not bent ventrally (Fig. 52) ..... ***bonariensis***

AESHNA ABSOLUTA CALVERT, 1952

Figures 1, 7, 9, 14, 20, 30, 41, 46, 51, 56, 61, 66

Aeshna diffinis: RIS, 1904: 24, 26-29 ("b" form); RIS, 1908: 523, 526-527 (in part, records from Buenos Aires, Mendoza and Pedregal); RIS, 1913: 84-85 (at least in part, records from Tafí, Tucumán, Bahía Blanca, Limay and Neuquén); NAVÁS, 1920d: 53; NAVÁS, 1930a: 125; FRASER, 1947: 433, 446; RODRIGUES CAPÍTULO, 1980: 9, 16-17, 20; fig. 19a; ABENANTE, 1982: 151; RODRIGUES CAPÍTULO & MUZÓN, 1989b: 147; RODRIGUES CAPÍTULO et al., 1991: 62, 66 (in part, records from Buenos Aires, Córdoba, Mendoza, Tucumán and Bolivia); RODRIGUES CAPÍTULO, 1992: 37, 57 (in part, records fom Buenos Aires, Córdoba, Mendoza and Tucumán); PÉREZ D'A. & MUTSCHKE, 1993-1994: 63-68; fig. 1; MUZÓN, 1995: 5-6 (in part, record from Choele Choel); MUZÓN & VON ELLENRIEDER, 1998: 23 (in part, records from Catamarca, Jujuy, Tucumán, Córdoba, Mendoza and Buenos Aires).

Aeshna diffinis absoluta: CALVERT, 1952: 258-260 (descr., type locality: vicinity of Concepción, Peru); CALVERT, 1956: 15, 133-134; tab. 2, 4, 5, 8, 11, 13, 17; pl. 14, figs. 179-191, map 6; RÁCENIS, 1959: 494; DAVIES & TOBIN, 1985: 1.

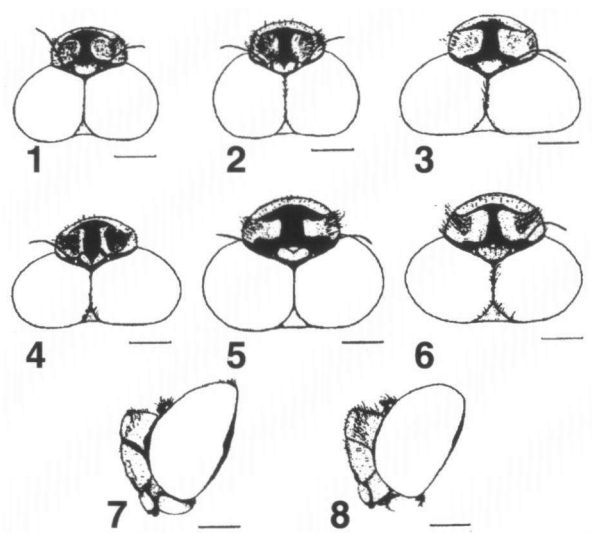
Aeshna diffinis diffinis: CALVERT, 1956: 127, 233; pl. 13, figs. 166-178 (in part, records from Peru, Humahuaca, Montevideo and Buschental); RÁCENIS, 1959: 494.

Aeshna absoluta: JURZITZA, 1990a: 353-372, figs. 2-6; RODRIGUES CAPITULO, 1992: 37, 56; fig. 174a, b; MUZÓN, 1995: 5 (in part, records from Piedra del Águila, Laguna Blanca,

Neuquén, Lago Aluminé, lago Los Cántaros, Salina del Gualicho, Choele Choel, Lago Mascardi, dique Ameghino, Cabo Blanco); MUZÓN, 1997: 127-128, 132-133; MUZÓN & VON ELLENRIEDER, 1998: 23.

Aeshna elsia: RODRIGUES CAPÍTULO, 1992: 37, 57.

DIAGNOSIS. – Wide black stripe along frontoclypeal groove. Black stripe along ocular groove widening towards fronto-clypeal groove (Fig. 7). Stem of T wider at base, gradually narrowing distally (Fig. 1); in 0.5% of the specimens examined the stem parallel. Mesanepisternal stripes present in 75% of the examined specimens, at basal 0.25-0.3. Mesepimeral and metepimeral stripes highly variable (Fig. 9): complete and wide, widening posterodorsally (1.38% ♂ and ♀); complete and wide of uniform width (♂ 15.5%, ♀ 41.32%); complete and narrow (♂ 19.5%, ♀ 38.5%); narrow at basal 0.75 (♂ 6.7%, ♀ 12.5%); narrow at basal 0.50 (♂ 12 %, ♀ 3.8 %); represented by a basal spot (♂ 20.22 %; ♀ 2.5%); absent (♂ 24.7%). Membranule black, white at basal 0.30 (91%) or 0.25 (9%). Veins black but C and ScP yellow. Dorsal colour pattern of abdomen as shown in Figs 20 and 30; lateral colour pattern of male as in *A. diffinis* (Fig. 26), and of female as in *A. variegata* light form (Fig. 40). Female abdominal segment II dorsally with a medio-longitudinal black stripe from transverse carina to posterior margin (Fig. 30). Ventral terga contour as shown in Figures 41 and 46, reddish brown with pattern of light blue to yellow kidney shaped spots variable in number and extension as expressed as follows: without light spots; one spot from anterior 0.80 to 0.30; or two spots, one anterior and the other posterior. Male cerci reddish brown to black; in dorsal view basal 0.30 gradually widening, afterwards inner and outer margins almost parallel (Fig. 56); tips pointed; subbasal tooth well developed; longitudinal dorsal carina well developed at distal 0.25 (Figs 51, 56). Female cerci lanceolate with acute tips; maximum width at medial 0.30 (Fig. 61).



Figs 1-8. Head [1-6 dorsal view, 7-8 lateral view]: (1, 7) *A. absoluta*; – (2, 8) *A. bonariensis*; – (3) *A. diffinis*; – (4) *A. confusa*; – (5) *A. variegata*, dark form; – (6) *A. variegata*, light form. – [Scale 2 mm].

Aeshna diffinis is

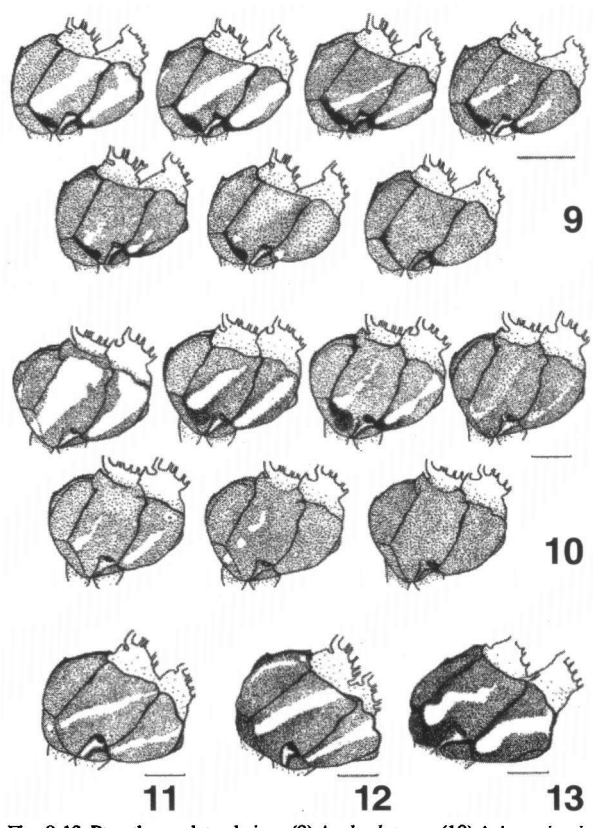
Table I

Measurements in mm (mean ± standard deviation; in square brackets: range) of the Patagonian *Aeshna* species

Feature	*absoluta*		*bonariensis*		*diffinis*		*confusa*		*variegata* light form		*variegata* dark form	
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
Head max width												
	7.7± 0.3	7.6±0.3	7.4±0.2	7.6±0.2	8.0±0.2	8.1±0.1	7.6±0.2	7.5±0.2	8.7±0.2	8.7±0.2	8.9±0.2	8.8±0.2
	[6.9-8.4]	[7.1-8.1]	[7.2-8]	[6.9-7.7]	[7.6-8.4]	[7.7-8.2]	[7.3-8.1]	[7.3-8.1]	[8.3-9.1]	[8-9.2]	[8.4-9.5]	[8.5-9.3]
	N=111	N=40	N=20	N=20	N=38	N=10	N=22	N=27	N=53	N=20	N=99	N=18
Ocular margin/frons width												
	1.9±0.2	1.9±0.1	2.0±0.1	2.0±0.1	2.0±0.1	1.8±0.2	2±0.2	1.8±0.2	1.9±0.2	1.8±0.1	1.8±0.1	1.8±0.1
	[1.6-2.3]	[1.7-2.2]	[1.7-2.4]	[1.8-2.3]	[1.7-2.3]	[1.4-2.2]	[1.6-2.4]	[1.6-2.5]	[1.6-2.3]	[1.6-2.1]	[1.6-2.1]	[1.6-2.1]
	N=111	N=40	N=20	N=20	N=38	N=10	N=22	N=27	N=53	N=27	N=99	N=18
Hindwing length												
	36.2±1.5	37.2±1.3	35.5±0.9	37.2±1.2	36.2±1.1	37.2±1.2	36.8±1.7	37.5±2.1	39.0±1.1	39.8±1.6	39.6±1.5	9.5±1.7
	[32-40]	[35-40.1]	[33.9-37.2]	[34.3-39.7]	[34.2-39.4]	[35.3-38.8]	[32.5-39.1]	[33.2-41.5]	[36.6-41.6]	[36.2-42.3]	[36.2-42.9]	[35.4-42.7]
	N=81	N=53	N=19	N=19	N=45	N=10	N=32	N=38	N=53	N=29	N=104	3 N=18
Hindwing width												
	11.8±0.5	12.2±0.4	11.3±0.3	12.4±0.4	11.7±0.4	12.5±0.4	12.1±0.5	12.9±0.7	12.4±0.4	12.9±0.5	12.5± 0.4	12.94± 0.5
	[10.5-12.9]	[10.6-13.1]	[10.5-11.8]	[11.5-13]	[11-12.8]	[11.9-13.7]	[11.2-13]	[11.7-14.4]	[11.5-13.5]	[12-14.1]	[11.4-13.5]	[12.1-13.8]
	N=81	N=53	N=19	N=20	N=45	N=10	N=32	N=38	N=53	N=29	N=104	N=17
Pterost. length												
	3.2±0.3	3.8±0.3	3.3±0.1	3.9±0.2	2.8±0.2	3.4±0.2	3.1±0.2	3.7±0.3	3.1±0.2	3.2±0.26	3±0.2	3.3±0.2
	[2.8-4.1]	[3.3-4.3]	[3.2-3.7]	[3.5-4.2]	[2.5-3.2]	[3.1-3.7]	[2.8-3.7]	[3.2-4.6]	[2.4-3.4]	[2.8-3.7]	[2.6-3.6]	[2.9-3.7]
	N=81	N=53	N=20	N=20	N=45	N=10	N=32	N=38	N=53	N=29	N=104	N=18
Length/width abd. seg. IV												
	1.7±0.2		1.8±0.3		1.2±0.1		1.8±0.2		1.4±0.17		1.3±0.1	
	[1.3-2.3]		[1.2-2.2]		[1-1.5]		[1.6-2.2]		[1.1-2.0]		[1.0-1.6]	
	N=77		N=20		N=45		N=20		N=52		N=104	
Cerci length												
	4.5±0.5	4.4±0.2	4.5±0.2	5.1±0.3	4.7±0.7	3.7±0.2	4.2±0.2	4.0±0.5	5±0.2	4.8±0.3	5.1±0.2	5.0±0.2
	[4.3-5.1]	[3.8-4.9]	[4.5-5.2]	[4.5-5.7]	[4.3-5.3]	[3.4-4.3]	[3.8-4.5]	[3-4.8]	[4.5-5.7]	[4.3-5.5]	[4.4-5.8]	[4.6-5.3]
	N=81	N=40	N=20	N=19	N=45	N=10	N=32	N=34	N=55	N=25	N=100	N=17
Epiproct length												
	2.3±0.2		2.1±0.1		2.7±0.1		2.2±0.1		2.6±0.2		2.8±0.1	
	[2-3.2]		[1.8-2.3]		[2.4-3]		[2-2.5]		[2.1-3.2]		[2.4-3.2]	
	N=81		N=20		N=45		N=32		N=55		N=100	
Length cerci/epiproct												
	2.0±0.1		2.2±0.1		1.7±0.1		1.8±0.1		1.8±0.1		1.8±0.1	
	[1.5-2.4]		[1.8-2.3]		[1.6-1.9]		[1.7-2.1]		[1.6-2.2]		[1.6-2.1]	
	N=81		N=20		N=45		N=32		N=55		N=100	
Body length												
	55.2±2.4	52.8±2.4	53.8±1.8	54.8±2.2	53.4±7.2	52.8±1.2	55.6±2.2	53.9±2.5	60.8±2.1	59.2±1.8	62.2±4.9	59.9±2.7
	[46.6-	[4.3-	[50-	[52.1-	[49.6-	[50-	[50.5-	[48.2-	[52.3-	[55.8-	[57.8-	[56.3-
	59.8]	56.5]	56.5]	57.8]	59.9]	54.2]	59.8]	59.4]	67.2]	62]	67.9]	67.2]
	N=81	N=53	N=20	N=19	N=45	N=10	N=32	N=34	N=55	N=25	N=97	N=17

most similar to *A. absoluta*, both sharing head, thorax, male abdominal colour patterns and the shape of male cerci. They differ in the contour of male and female ventral terga (Figs 41, 43, 46, 48) the shape of female cerci tips (Figs 61, 63) and the dorsal abdominal colour pattern of the female (Figs 30, 31).

DISTRIBUTION. – Type locality: PERU: vicinity of Concepción (CALVERT, 1952). PERU: Junín; Cuzco; Ayacucho; Arequipa. URUGUAY: Montevideo; San José. ARGENTINA: Jujuy; Salta; Tucumán; La Rioja; San Juan; Mendoza; Santiago del Estero; Córdoba; Santa Fé; Entre Ríos; La Pampa; Buenos Aires. Patagonia: Neuquén: San Martín de Los Andes (MLP); Piedra del Águila (MUZÓN, 1995); laguna Blanca (MUZÓN, 1995); P.N. Lanín, ruta 61, 5 km W ruta 234, camino al lago Huechulafquen (MLP); lago Ñorquinco (MLP); nacimiento río Aluminé (MLP); lago Aluminé (MLP; JURZITZA, 1990a; MUZÓN, 1995); Neuquén (MLP; JURZITZA, 1990a; RODRIGUES CAPÍTULO, 1992; MUZÓN, 1995); río Salado (MLP); ruta 40, 9 km N Buta Ranquil (MLP). Río Negro: Ayo. El Caín, camino a Ruca Choroy (MLP); laguna Cari Laufquen Chica (MLP); Vertiente, Rt. 5, aprox. 15 km S Maquinchao (MLP); P.N. Nahuel Huapi, lago Mascardi (MLP; MUZÓN, 1995); P.N. Nahuel Huapi, lago Los Cántaros (MLP; MUZÓN, 1995); Comi-Có, Ayo. Comi-Có (MLP); Vertiente Ea. El Rincón (MLP); Ramos Mexia (MLP); charca temp., Rt. 23, 7 km W desvío Rt.3 (MLP); Salina del Gualicho (MLP; MUZÓN, 1995); Choele Choel (MLP; MUZÓN, 1995); Dique El Chocón (MLP; RODRIGUES CAPÍTULO, 1992). Chubut: Comodoro Rivadavia (MACN); Dique Florentino Ameghino (FML; MUZÓN, 1995); río Mayo (FML); Esquel, laguna La Zeta (MLP); Península Valdés, Puerto Pirámide (MLP). Santa Cruz: Cabo Blanco, margen Sur Golfo San Jorge (MUZÓN, 1995). CHILE: Santiago region: Santiago. Patagonia: Biobío region: Arauco: Caramávida, W Cordillera de Nahuelbuta (UMMZ). Magallanes region: Magallanes: Estancia Brazo Norte (PDA; PEREZ D'A. & MUTSCHKE, 1993-1994).



Figs 9-13. Pterothorax, lateral view: (9) *A. absoluta*; – (10) *A. bonariensis*; – (11) *A. diffinis*; – (12) *A. confusa*; – (13) *A. variegata*. – [Scale 5 mm].

REMARKS. – CALVERT (1952) described *Aeshna absoluta* from Peru as a subspecies of *A. diffinis*. He considered it a subspecies of *A. diffinis* and not of *A. bonariensis* only because the first two taxa shared a predominantly Pacific distribution in contrast with the Atlantic distribution of *A. bonariensis*. JURZITZA (1990a) raised *A. diffinis absoluta* to specific rank, and extended its distribution to Argentina. The main character used by CALVERT (1952, 1956) to distinguish between the two subspecies was the extension of the pale pterothoracic stripes. I observed variability in the extension of stripes

from complete to absent within several populations (i.e. Rio Negro prov., Valcheta, Vertiente Ea. El Rincón, 620 m, 40°59'24"S 66°40'36"W, 28/30-I-1999, 13 ♂, 5 ♀, 1 copula, MLP). Therefore, the lack of pale stripes is not necessarily due to a deficient conservation (CALVERT, 1956; JURZITZA, 1990b). This variability explains why CALVERT misidentified some specimens of *A. absoluta* and *A. d. diffinis*, i.e. the material from Buschental, Uruguay, that he included in his monograph (1956) and some specimens from Peru deposited at UMMZ. Some characters proposed by JURZITZA (1990a) to distinguish between the two species (bicoloured pterostigma, extension of pale spots in the male ventral terga IV-VIII, width/length rate of male abdominal segment VI, concavity of the anterior margin of anterior hamular ventral horn, relative position of the transverse carina in abdominal tergite VII and length of female cerci), are also variable. Although the abdominal segments of *A. absoluta* males are generally narrower than those of *A. diffinis* males, the ranges of width/length ratio of both species partially overlap as does female cerci length (longer in average in *A. absoluta* than in *A. diffinis*, Tab. I).

Aeshna absoluta occupies predominantly dry environments from southern Patagonia to central Peru (Fig. 66). In Patagonia it inhabits mainly steppe areas, being found in the eastern forest of the Andes only in areas near the steppe where it is sympatric with *A. diffinis*. Only two specimens have been found west to the Andes: one from Caramávida (Arauco, Chile) and another from El Canelillo (Santiago, Chile).

Aeshna absoluta was probably cited as *A. diffinis* several times; i.e. no available specimens for this study recorded by HAGEN, 1875: 38-39 (in part: record from Lima, Peru); MARTIN, 1908-1909: 43-44; MARTIN, 1911: 11 and MARTIN, 1921: 22 (in part: listed from Peru and Bolivia); NAVÁS, 1933: 54 (record from Arequipa, Peru); SCHMIDT, 1952: 239 (records from Peru: Ica, Hacienda Huayuri, Sachabamba, Río Sondondo); SOUKUP, 1954: 15-16 (records from Peru: Cajamarca dept., Amazonas dept., Chachapoyas and Moyobamba); CUMMING, 1964: 65 (chromosome number, specimens from Bolivia); PAULSON, 1977: 175 (in part: listed from Brazil and Uruguay).

AESHNA BONARIENSIS RAMBUR, 1842

Figures 2, 8, 11, 15, 21, 42, 47, 52, 57, 62, 67

Aeshna bonariensis: RAMBUR, 1842: 204 (descr., type locality: Buenos Aires); HAGEN, 1861: 314; HAGEN, 1875: 39; RIS, 1904: 24-25; MARTIN, 1908: 51-52, fig. 48; RIS, 1908: 523, 525-526; CALVERT, 1909: 221; MARTIN, 1911: 12; NAVÁS, 1911: 476, 478; COCKERELL, 1913: 580; RIS, 1913: 85; NAVÁS, 1917: 187; RIS, 1918: 158; NAVÁS, 1920a: 132; NAVÁS, 1920c: 267; MARTIN, 1921: 23; CAMPION, 1922: 292-293; MARTIN, 1923: 109; NAVÁS, 1927: 23; GAZULLA & RUIZ, 1928: 290; NAVÁS, 1929c: 220; PIRIÓN, 1933: 82; FRASER, 1947: 433, 448; CALVERT, 1952: 257-258; HERRERA, et al., 1955-1966: 81; CALVERT, 1956: 14, 140-144, 227; pl. 3, figs. 23-37, map 6; FRASER, 1957: 159; MARTINS COSTA, 1971: 194; PAULSON, 1977: 175; ABENANTE, 1978: 29-48; ABENANTE, 1980: 105-149; RODRIGUES CAPÍTULO, 1980: 1-21, figs 1-41; ABENANTE,

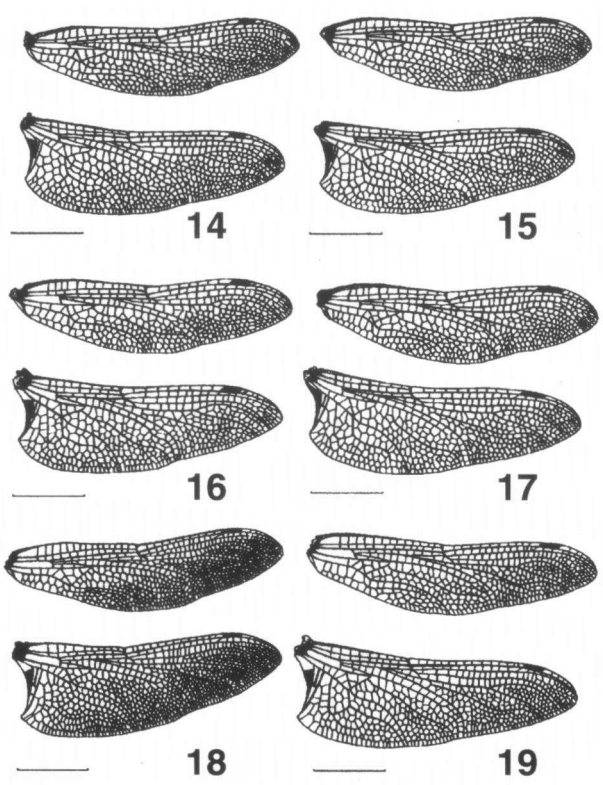
1982: 151; DAVIES & TOBIN, 1985: 2; JURZITZA, 1989: 7; JURZITZA, 1990a: 353-372, figs. 2-6; MOLA, 1991: 10; RODRIGUES CAPÍTULO, et al., 1991: 62, 66; WATSON, 1992: 455, 657-462; PITZKE-WIDDIG, 1992: 116, 122; RODRIGUES CAPÍTULO, 1992: 37, 56; fig. 177a, b; MOLA & PAPESCHI, 1994: 185-188; MOLA, 1995: 47-54; MUZÓN, 1995: 5; MUZÓN & VON ELLENRIEDER, 1997: 146; CARVALHO & NESSIMIAN, 1998: 7; MUZÓN & VON ELLENRIEDER, 1998: 23; MARTINS COSTA & DOS SANTOS, 1999: 4.

Aeschna dicrostigma: SELYS *in* MARTIN, 1908: 53 (*nomen nudum*).

Neureclipa bonariensis: NAVÁS, 1911: 476, 478 (*comb. nov.*).

Aeshna bonaerensis var. *lutea*: NAVÁS, 1920b: 11; NAVÁS, 1920c: 267; NAVÁS, 1928: 340.

DIAGNOSIS. – Frontoclypeal groove with no black stripe. Black stripe along ocular groove uniform in width (Fig. 8). Stem of **T** parallel sided in 80% of specimens examined (Fig. 2); in the remaining 20% stem narrows slightly towards **T**. Mesanepisternal stripes present in 65% of the examined specimens, at basal 0.25--0.3. Mesepimeral and metepimeral stripes variable: Complete and widening posterodorsally (9.3% ♂ and 35.5% ♀); complete and wide of uniform width (♂ 54.7%, ♀ 43%); complete and narrow (♂ 26.8%, ♀ 13%, Fig. 11); narrow, metepimeral complete and mesepimeral at basal 0.75 (♂ 5.5%, ♀ 3.2%); narrow at basal 0.50 to 0.75 (♂ 1.85%, ♀ 2.1%); absent (♂ 1.85%, ♀ 3.2%). Membranule black, basal 0.15 white. Veins black but C, ScP, R_1, RP and MP yellow. Abdominal dorsal and lateral colour patterns of female and dorsal colour pattern of male as in *A. confusa* (Figs 23, 32, 38), lateral colour pattern of male as in *A.*



Figs 14-19. Wings: (14) *A. absoluta*; – (15) *A. bonariensis*; – (16) *A. diffinis*; – (17) *A. confusa*; – (18) *A. variegata*, dark form; – (19) *A. variegata*, light form. – [Scale 1 cm].

diffinis (Fig. 26). Abdominal dorsal colour pattern of female dimorphic, with andromorph females whose dorsal colour pattern is similar to male, bearing PD spots, and heteromorph females whose dorsal colour pattern is different from male, without PD spots. Ventral terga contour as shown in Figures 42 and 47, reddish brown with light blue to yellowish kidney shaped spot variable in extension, from anterior 0.80 to 0.50. Male cerci reddish brown to black, with a basal outer pale spot; in dorsal view basal 0.30 widening gradually to maximum width at 0.50, then narrowing at distal 0.20; tips pointed; subbasal tooth well developed; longitudinal dorsal carina well developed between distal 0.25-0.20 (Figs 52, 57). Female cerci lanceolate with acuminate tips; maximum width between basal 0.30-0.50 (Fig. 62).

Aeshna bonariensis shares with *A. confusa* the abdominal and membranule colour patterns. The abdominal pattern differs only in the extension of PD in male VI-VII segments. In *A. bonariensis* PD extends anteriorly to MD whereas in *A. confusa* it occupies only the posterior 0.25 (Figs 21, 23). PD and PL are confluent in *A. bonariensis*, separated in *A. confusa* (Fig. 27). Male cerci of both species have a basal outer pale spot but differ in their contour in lateral view and in the degree of development of the subbasal teeth (Figs 52, 54). Female cerci of *A. bonariensis* and *A. absoluta* are similar. *A. bonariensis* differs from the other Patagonian species by the head colour pattern (narrow black fronto-ocular stripe of uniform width and **T** spot parallel sided). The male cerci are also unique in having the lower dorsal crest not higher than basal cerci height in lateral view.

DISTRIBUTION. – Type locality: Buenos Aires (RAMBUR, 1842). BRAZIL: Rio Grande do Sul; Santa Catharina; Paraná; São Paulo; Minas Geraes; Río de Janeiro. PARAGUAY: Paraguarí. URUGUAY: Montevideo; San José; Colonia; Florida. ARGENTINA: Jujuy; Salta; Tucumán; Misiones; Formosa; Chaco; Catamarca; La Rioja; San Juan; Mendoza; Córdoba; Santiago del Estero; Corrientes; Entre Ríos; Santa Fé; Buenos Aires. Patagonia: Río Negro: bahía San Matías (HAGEN, 1875); P.N. Nahuel Huapi, lago Nahuel Huapi, isla Victoria (MLP). CHILE: Valparaiso region: Valparaiso, Quillota. Patagonia: Araucanía region: Cautín: Temuco, cerro Ñienol (HERRERA et al., 1955-1966; JURZITZA, 1989).

REMARKS. – *Aeshna bonariensis* Rambur, 1842 was described from Buenos Aires, Argentina. Several authors have recorded *A. bonariensis* from Patagonia and Chile (HAGEN, 1861, 1875; MARTIN, 1911; GAZULLA & RUIZ, 1928; CALVERT, 1956; HERRERA et al., 1955-1966; RODRIGUES CAPÍTULO et al., 1991; RODRIGUES CAPÍTULO, 1992). NAVÁS (1911) described *Aeshna litigatrix* based on material from São Paulo, Brazil. CALVERT (1956) considered it to be a synonym of *A. bonariensis*, although he had not examined type material. Since I have also been unable to examine these types, I have refrained from including *A. litigatrix* in the synonymy. The specimens deposited at MLP determined as *A. bonariensis* var. *lutea* by Navás (Corrientes: Chavarría, 25-I-1919, 1 ♀; San Roque, Bosqi leg., II-1920, 1 ♂, 1 ♀) show no consistent differences from typical *A. bonariensis*. The larva has been described by ABENANTE (1978) and RODRIGUES CAPITULO (1980).

Aeshna bonariensis occurs from the northern half of Argentina, through Uruguay, Paraguay and southern Brazil (Fig. 67). JURZITZA (1989, 1990a) and MUZÓN

Table II

Venation features of the Patagonian *Aeshna* species. – [In square brackets: range; – in brackets: highest frequency value; – *: only at posterior or medial row]

Feature	*absoluta*		*bonariensis*		*diffinis*		*confusa*		*variegata* light form		*variegata* dark form	
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
Antenodals												
Ant.	[12-17]	[10-15]	[11-15]	[12-14]	[11-15]	[11-14]	[12-16]	[11-15]	[11-17]	[11-15]	[12-18]	[12-19]
	(13)	(13)	(13)	(13)	(13)	(13)	(13)	(12)	(13)	(13)	(14)	(14)
Post.	[7-12]	[7-11]	[7-10]	[8-10]	[8-12]	[8-10]	[8-10]	[8-11]	[7-12]	[7-12]	[8-12]	[7-13]
	(8)	(8)	(9)	(9)	(8)	(8)	(9)	(9)	(9)	(9)	(10)	(9)
Cells triangle												
Ant.	[2-5]	[3-4]	[3-4]	[2-3]	[2-4]	[3-4]	[4-5]	4	[2-5]	[2-5]	[3-5]	[3-6]
	(3)	(3)	(3)	(3)	(3)	(3)	(4)		(4)	(4)	(4)	(4)
Post.	[2-4]	[2-4]	[3-4]	[2-4]	[2-4]	[2-4]	[3-5]	[3-5]	[3-4]	[3-5]	[3-6]	[3-5]
	(3)	(3)	(3)	(3)	(3)	(3)	(4)	(4)	(4)	(4)	(4)	(4)
Crossed veins supratriangle												
Ant.	[0-1]	[0-2]	0	[0-1]	[0-1]	[0-2]	[1-3]	[1-4]	[0-3]	[1-3]	[1-3]	[1-3]
	(0)	(0)		(0)	(0)	(0)	(2)	(2)	(2)	(2)	(2)	(2)
Post.	[0-1]	[0-1]	[0-1]	[0-1]	[0-1]	[0-1]	[1-2]	[1-3]	[1-2]	[1-2]	[1-3]	[1-2]
	(0)	(0)	(0)	(0)	(0)	(0)	(2)	(2)	(1)	(1)	(2)	(2)
Crossed veins cubital space												
Ant.	[4-6]	[4-5]	[4-6]	[4-6]	[4-6]	[4-6]	[5-6]	[4-6]	[4-6]	[4-6]	[4-6]	[4-7]
	(4)	(4)	(4)	(4)	(4)	(4)	(5)	(5)	(5)	(5)	(5)	(5)
Post.	[3-5]	[3-5]	[3-5]	[3-5]	[3-5]	[3-4]	[5-6]	[4-6]	[4-5]	[4-6]	[4-6]	[4-6]
	(4)	(4)	(4)	(4)	(4)	(4)	(5)	(5)	(5)	(5)	(5)	(5)
Cells rows bet. IR2a-IR2b at pterost. level												
Ant.	[3-4]	[3-4]	[2-3]	[2-3]	[2-3]	[2-3]	[2-3]	[2-3]	[3-4]	[3-4]	[2-5]	[3-5]
	(3)	(3)	(2)	(2)	(3)	(3)	(2)	(2)	(3)	(3)	(4)	(4)
Post.	[3-4]	[3-4]	[2-3]	[2-4]	[2-3]	3	[2-3]	[2-3]	[3-4]	[3-4]	[3-5]	[3-5]
	(3)	(3)	(2)	(2)	(3)		(2)	(2)	(3)	(3)	(4)	(4)
Bridge cross veins												
Ant.	[2-4]	[1-3]	[2-3]	[2-3]	[1-3]	[2-3]	[2-3]	[2-3]	[2-4]	[2-5]	[1-4]	[2-4]
	(2)	(2)	(2)	(2)	(2)	(3)	(2)	(2)	(3)	(2)	(3)	(2)
Post.	[2-3]	[1-3]	[2-3]	[2-3]	[2-3]	[2-3]	2	2	[1-3]	[1-3]	[1-4]	[2-3]
	(2)	(2)	(2)	(2)	(2)	(2)			(2)	(2)	(2)	(2)
Anal loop cells												
Post.	[5-10]	[5-11]	[6-10	[5-8]	[5-9]	[5-7]	[6-10]	[7-12]	[5-13]	[7-12]	[7-17]	[7-18]
	(7)	(7)	](7)	(7)	(6)	(7)	(9)	(9)	(8)	(8)	(9)	(9)
Cell rows anal loop												
Post.	[2-3]	[2-3]	[2-3*]	[2-3*]	[2-3*]	2	[2-3]	3	[2-4*]	[2-4*]	[2-4*]	[3-4*]
	(2)	(2)	(2)	(2)	(2)		(3)		(3)	(3)	(3)	(3)

(1995) doubted records from Patagonia as recorded by some former workers (HAGEN, 1861, 1875; MARTIN, 1911; GAZULLA & RUIZ, 1928; CALVERT, 1956; HERRERA et al., 1955-1966; RODRIGUES CAPÍTULO et al., 1991; RODRIGUES CAPÍTULO, 1992). I examined a single specimen from Patagonia (Río Negro, Victoria island on Nahuel Huapi lake, O. de Ferraris leg., I-1949, 1 ♀, MLP). Its occasional occurrence in Patagonia and Chile is probably due to occasional dispersal outside its usual breeding area.

AESHNA DIFFINIS RAMBUR, 1842

Figures 3, 10, 16, 22, 26, 31, 37, 43, 48, 53, 58, 63, 66

Aeshna diffinis: RAMBUR, 1842: 203-204 (descr., type locality: Chile); HAGEN, 1861: 314; HAGEN, 1875: 38-39 (in part, records from Quillota and Valparaiso); SELYS, 1895: 61; PORTER, 1897: 13; PORTER, 1899: 181; RIS, 1904: 24, 26-29 (in part: "a" form); MARTIN, 1908: 43-44, fig. 40 (in part: records from Chile); RIS, 1908: 523, 526-527 (in part: record from Chile); NAVÁS, 1917b: 38; CAMPION, 1922: 292-293; MARTIN, 1923: 109; PIRION, 1928: 96-97; GAZULLA & RUIZ, 1928: 290; NAVÁS, 1929a: 145; NAVÁS, 1929b: 326; NAVÁS, 1930b: 350; PIRION, 1933: 81; URETA, 1935: 93; NEEDHAM & WESTFALL, 1943: 358-359; HERRERA et al., 1955-1966: 81; PEÑA, 1962: 4; FRASER, 1957: 159; PAULSON, 1977: 175 (in part: records from Argentina and Chile); DAVIES & TOBIN, 1985: 3; JURZITZA, 1990a: 353-372, figs. 2-6; RODRIGUES CAPÍTULO et al., 1991: 62, 66 (in part: record from Neuquén); RODRIGUES CAPÍTULO, 1992: 37, 57; fig. 175a, b (in part: record from Neuquén); MUZÓN, 1995: 5-6 (in part: records from San Martín de Los Andes, Quilauhue, C° Los Pinos, Piedra del Águila, A° Neuquenco, lago Tromen, Villa Angostura, lago Nahuel Huapi, Ñirihuau, Gualjaina, intendencia P.N. Los Alerces, Fofocahuel, lago Epuyén); MUZÓN, 1997: 127-128, 132-133; MUZÓN & VON ELLENRIEDER, 1997: 146; MUZÓN & VON ELLENRIEDER, 1998: 23 (in part: records from Neuquén, Río Negro and Chubut).

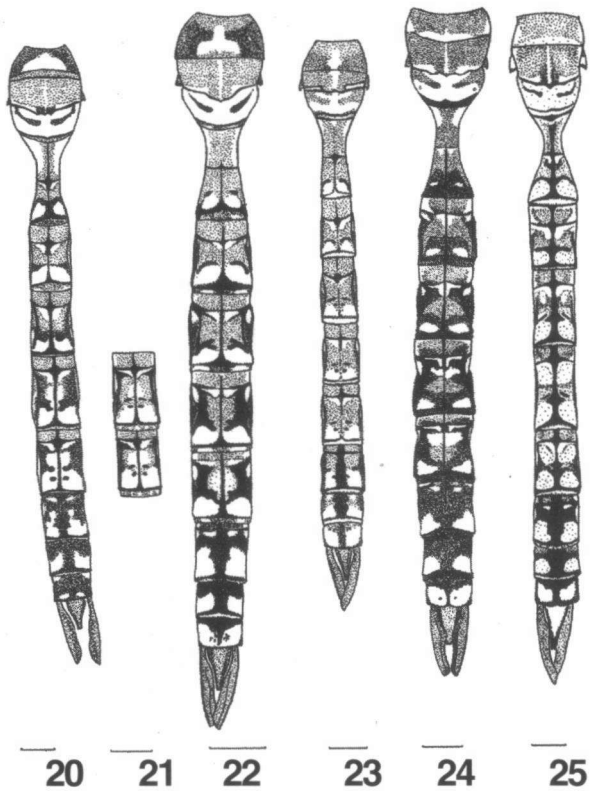
Aeschna configurata: HAGEN, 1861: 314 *nomen nudum*.

Aeschna bonariensis: BOLIVAR, 1884: 5-6

Aeshna diffinis diffinis: CALVERT 1952: 258; CALVERT 1956: 14, 126-133, 201-203, 232; pls 11, 12, 42, figs. 145-165, 555-561; map 6 (in part: records from Villa Angostura, Punta Teatina, Serena, Miramar, camino a Farellones, Tobalaba, Valparaiso, Villa Alemana, Quilpué, Santiago, Cordillera, El Manzanito, Alhué, Talca, Baños de Cauquenes, Linares, Penco, Concepción, Angol, Miguel Cerdá, Filuca). BÖTTGER & JURZITZA, 1967: 35-37; figs. 1: 5a, 6a, 4: Ia, 5: Ia-Ib; JURZITZA, 1975: 10-11; JURZITZA, 1989: 8-9 (in part); WATSON, 1992: 455, 657-462.

Aeshna absoluta: MUZÓN 1995: 5 (in part: record from Chubut, intendencia P.N. Los Alerces).

DIAGNOSIS. — Head as in *A. bonariensis* (Fig. 3). Mesanepisternal stripes present in 12% of the examined specimens, at basal 0.25-0.3. Mesepimeral and metepimeral stripes variable (Fig. 10): Complete and wide widening posterodorsally (8.3% ♂ and 7.75% ♀); complete and wide and of uniform width (♂ 8.6%, ♀ 43.05%); complete and narrow (♂ 12%, ♀ 14.7%); narrow at basal 0.75 (♂ 17%, ♀ 10.7%); narrow at basal 0.50 (♂ 27.5%, ♀ 9.5%); represented by a basal spot (♂ 6.8%); absent (♂ 19.5%, ♀ 14.3%). Membranule black, basal 0.30 white. Veins black but C and ScP yellow. Abdominal colour pattern as shown in Figures 22, 26, 31 and 37. Ventral terga contour as shown in Figures 43 and 48, reddish brown with pattern of light blue to yellow kidney shaped spots variable in number and extension: Without light spots; or one spot from anterior 0.80 to 0.25. Male cerci reddish brown to black; in dorsal view basal 0.30 gradually widening, then inner and outer margins almost parallel; tips pointed; subbasal tooth well developed; longitudinal dorsal crest well developed at distal 0.25 (Figs 53, 58). Female cerci lanceolate, with rounded tips; maximum width between basal and distal 0.25 (Fig. 63).



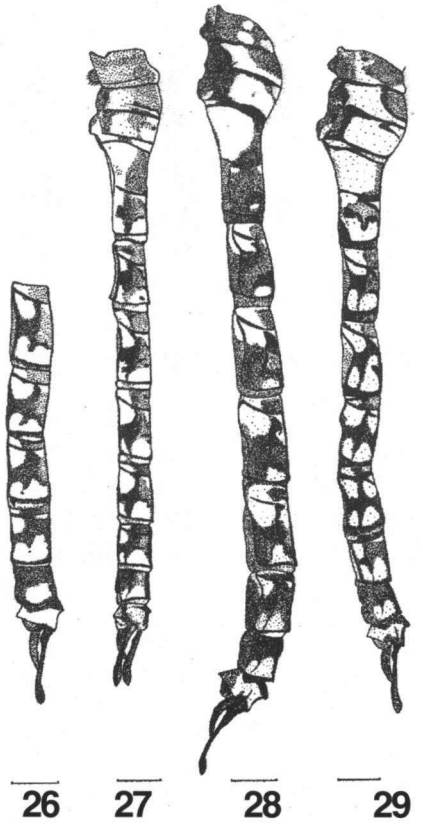
Figs 20-25. Male abdomen, dorsal colour pattern: (20) *A. absoluta*; – (21) *A. bonariensis*; – (22) *A. diffinis*; – (23) *A. confusa*; – (24) *A. variegata*, dark form; – (25) *A. variegata*, light form. – [Scale 2 mm].

Aeshna diffinis is similar to *A. variegata* in male and female ventral terga contour and in shape of female and male cerci in lateral view but the shape of male cerci differs in dorsal view; in *A. variegata* the distal 0.6 of inner margin is concave, not parallel as in *A. diffinis* (Figs 58, 60).

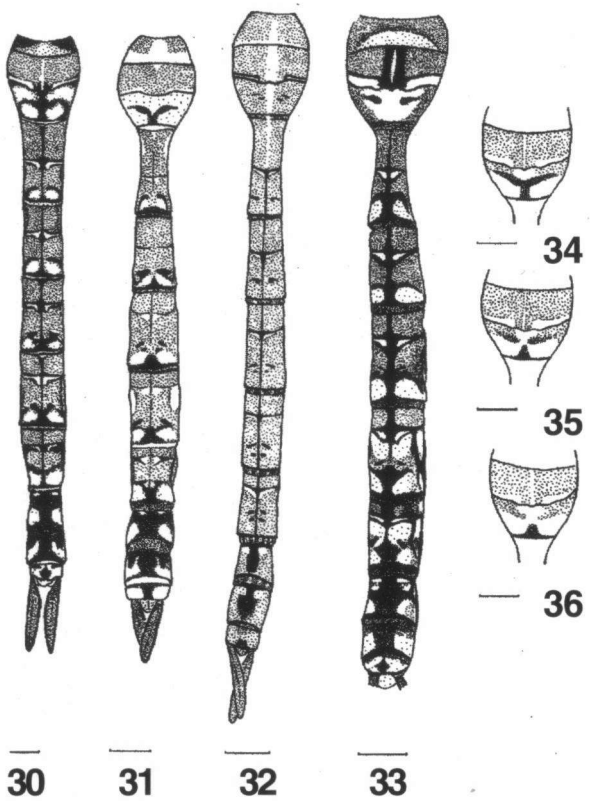
DISTRIBUTION. – Type locality: Chile (RAMBUR, 1842). ARGENTINA: Patagonia: Neuquén: P.N. Nahuel Huapi, lago Queñi (MLP); P.N. Nahuel Huapi, camino de los Siete Lagos, Arroyo Neuqueñco (MLP, MUZÓN, 1995); Villa La Angostura (MUZÓN, 1995); P.N. Lanín, desborde A° Quechuquina (MLP); San Martín de Los Andes (MUZÓN, 1995); Quilauhue (MUZÓN, 1995); Piedra del Águila (MLP; MUZÓN, 1995); P.N. Lanín, lago Curruhue Grande (MLP); lago Paimún (MLP); A° Malleo (MLP); P.N. Lanín, lago Tromen (MLP; MUZÓN, 1995); Quillén (MLP); Pulmarí (MLP); lago Aluminé (MLP); Ayo. Huarenchenque (MLP), Cerro Los Pinos (MUZÓN, 1995). Río Negro: Ñorquinco, río Chico, ruta 6 (MLP); P.N. Nahuel Huapi, lago Mascardi (MLP); P.N. Nahuel Huapi, lago Nahuel Huapi, desembocadura río Ñirihuau (MLP; MUZÓN, 1995); El Bolsón (MLP). Chubut: lago Epuyén (CAMPION, 1922; MUZÓN, 1995); Fofocahuel, río Chubut superior (CAMPION, 1922; MUZÓN, 1995); 20 km W Alto río Senguerr, camino al lago Fontana (FML); Tecka (MLP); Paso Futaleufú (MLP); Trevelin (MLP); Esquel, laguna La Zeta (MLP); lago Futalaufquen (FML); P.N. Los Alerces (MLP); P.N. Los Alerces, Intendencia (MLP; MUZÓN, 1995); Gualjaina (MUZÓN, 1995). CHILE: Atacama region: Copiapó; Huasco. Coquimbo region: Elqui; Limarí; Choapa. Santiago region: Chacabuco; Santiago; Talagante; Cordillera; Maipo; Mellipilla. Valparaiso region: Aconcagua; Quillota; Valparaiso; San Antonio. Libertador General O'Higgins region: Cachapoal; Cardenal Caro; Colchagua. Maule region: Curicó; Talca; Cauquenes; Linares. Patagonia: Biobío region: Ñuble: Las Trancas (IEUM); Atacalco, 8 km SE Recinto, margen río Diguillín (UMMZ); Recinto, precordillera de Los Andes (UMMZ); Los Pellines, margen del río Chillán, 10 km N Recinto (UMMZ); Chillán (NAVÁS, 1929a); Monte Zorro, 12 km N río Itata (UMMZ); San Fabián de Alico (UMMZ); Cobquequra (UMMZ); Nogueche (UMMZ). Concepción: Coronel (ZMH); Concepción (CALVERT, 1956); Concepción,

río Andalién (JURZITZA, 1975); Penco (CALVERT, 1956); San Fernando (JURZITZA, 1975; 1989). Biobío: Los Angeles (IEUM); Antuco (UMMZ); Salto del Laja (IEUM). Arauco: Pichinahuel, cordillera de Nahuelbuta (UMMZ); Pillim-Pilli, cordillera de Nahuelbuta (UMMZ); Contulmo, (IEUM; UMMZ; WATSON, 1992); Caramávida (UMMZ); 5 km E Caramávida, río Caramávida (MLP). Araucanía region: Malleco: Angol (CALVERT, 1956); Angol, Cumbre (NAVÁS, 1929b); Cordillera de Nahuelbuta, río en ruta Angol-Vegas Blancas (MLP); cercanías río Malleco (CALVERT, 1956); Alto Nahuelbuta (UMMZ); Curacautín, Termas de Tolhuaca (IEUM; UMMZ). Cautín: Termas de Palguín (IEUM). De los Lagos region: Valdivia: lago Ranco (MLP); lago Ranco, Llifén (MLP); Valdivia (IEUM; MLP; RIS, 1904; BÖTTGER & JURZITZA, 1967; JURZITZA, 1975; 1989; 1990a); Valdivia, Fundo Caupolicán (MHNS); camino San Jose de Mariquina-Valdivia, 30 km N Valdivia (MLP); Panguipulli (NAVÁS, 1930b); Termas de Coñaripe, lago Pellaifa (MLP); río junto a ruta Coñaripe-Carringue (MLP); Lican Ray (MHNS). Osorno: camino Hueyusca-Bahía de San Pedro (MLP); Puyehue (IEUM); P. N. Puyehue, laguna El Toro (MHNS); P. N. Puyehue, Aduana Pajaritos (MHNS). Llanquihue: Puerto Montt, charca cerca de Correntoso (MLP); Frutillar (MHNS); Peulla (IEUM). Palena: Chaitén (UMMZ). Chiloe: Aucar (UMMZ); Chepu, sobre río Chepu (UMMZ); Ancud (UMMZ); Ancud, Calle (IEUM); Ancud, Guabú (IEUM). Aisén region: Aisén: Puerto Cisnes (JURZITZA, 1989); Balseadero, orillas del río Mañiguales, 20 km Puerto Aisén (URETA, 1935). Coihaique: 1 km W Villa La Tapera, charcas de desborde del río Cisnes (MLP); Miguel Cerdá (Calvert, 1956). General Carrera: Chile Chico (MHNS).

REMARKS. – *Aeshna diffinis* Rambur, 1842 was described from Chile. HAGEN, (1861) described *A. configurata* based on specimens from Valparaiso. Later, he (1875) synonymyzed it with *A. diffinis*, and extended its distribution area to Peru. BOLIVAR (1884) recorded *A. bonariensis* from southern Chile, giving a brief description including body and hind wing length measurements that agree with those of *A. diffinis*. RIS (1904) described three forms ("a", "b" and "c") of *A. diffinis*. From his descriptions and distributions form "a" corresponds to *A. diffinis*, form "b" to *A. absoluta* and form "c" to *A. variegata*. MARTIN (1908, 1911, 1921) recorded *A. diffinis* from Tierra del Fuego, probably following RIS' (1904) record of the "c" form of *A. diffinis* that corresponds to *A. variegata*. CALVERT (1956) provided a brief description of the larva.



Figs 26-29. Male abdomen, lateral colour pattern: (26) *A. absoluta*; – (27) *A. confusa*; – (28) *A. variegata*, dark form; – (29) *A. variegata*, light form. – [Scale 2 mm].



Figs 30-36. Female abdomen, dorsal colour pattern: (30) *A. absoluta*; – (31) *A. diffinis*; – (32) *A. confusa*, heteromorph; – (33) *A. variegata*, dark form; – (34-36) *A. variegata*, light form. – [Scale 2 mm].

Records of *A. diffinis* from northern Chile by PORTER (1897: 13, Copiapó; 1899: 181, Atacama) and NEEDHAM & ETCHEVERRY (1955-1966: 213, Tarapacá) may refer to *A. elsia* since the northernmost locality of *A. diffinis* from our material is Huasco (Atacama region, Chile). CALVERT (1956) considered the distribution of *A. diffinis* to encompass 12°S in Peru to 41°S in Chile and Argentina including intervening areas within Uruguay, Paraguay and Brazil. Records from our material agree with the distribution proposed by JURZITZA (1990a); *A. diffinis* is restricted to the subantarctic forest in Chile and Argentina, and extends northwards outside forested areas only west to the Andes (between 45° and 28°S). Therefore its distribution is limited to the Subantarctic and Central Chilean subregions of the Andean region (sensu MORRONE, 1999).

AESHNA CONFUSA RAMBUR, 1842

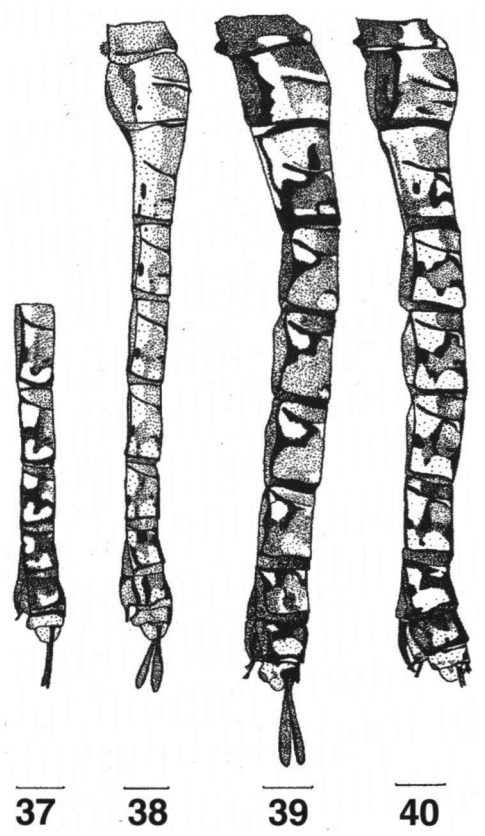
Figures 4, 12, 17, 23, 27, 32, 38, 44, 49, 54, 59, 64, 67

Aeshna confusa: RAMBUR, 1842: 205 (descr., type locality: Buenos Aires); HAGEN, 1861: 314; HAGEN, 1875: 39; RIS 1904: 24-25; MARTIN, 1908: 52-53, fig. 49; RIS, 1908: 523, 525; MARTIN, 1911: 12; RIS, 1913: 85; NAVÁS, 1916: 17; NAVÁS, 1917: 187; MARTIN, 1921: 22; MARTIN, 1923: 109; NAVÁS, 1927: 23; GAZULLA & RUIZ, 1928: 290; NAVÁS, 1929c: 220; PIRION, 1933: 81; SCOTT, 1934: 279 (cited by MIELEWCZYK, 1978); NEEDHAM & WESTFALL, 1943: 358-359; FRASER, 1947: 433, 448; MIELEWCZYK, 1978: 29; CALVERT, 1956: 11, 30-34, 230; pl. 8, figs. 91-101a, map 3; FRASER, 1957: 159;

PAULSON, 1977: 175; ABENANTE, 1982: 151; DAVIES & TOBIN, 1985: 2; JURZITZA, 1989: 7-8; MOLA, 1991: 10; RODRIGUES CAPÍTULO et al., 1991: 62, 66; WATSON, 1992: 454, 657-462; RODRIGUES CAPÍTULO, 1992: 39, 56; fig. 179a, b; MOLA & PAPESCHI, 1994: 185-188; MOLA, 1995: 47-48, 54; MUZÓN, 1997: 127-128, 132; MUZÓN & VON ELLENRIEDER, 1998: 23.

DIAGNOSIS. – Frontoclypeal groove with no black stripe (as in Fig. 8). Black stripe along ocular groove, widening towards fronto-clypeal groove (as in Fig. 7). Stem of **T** wider at base, gradually narrowing distally (Fig. 4). Pterothoracic pale stripes complete and straight (Fig. 12). In a single specimen (♀ from Buenos Aires, Punta Lara, 23-XII-1996, MLP), metepimeral stripes extend only at ventral 0.65. Membranule black, basal 0.15 white. Veins black but C, ScP, R_1, RP and MP yellow. Abdominal colour pattern as shown in Figures 23, 27, 32, and 38. Abdominal dorsal colour pattern of female dimorphic, andromorph females bearing PD spots, and heteromorph females without PD spots. Ventral terga contour as shown in Figures 44 and 49, reddish brown with a light blue to yellowish kidney shaped spot variably extending from anterior 0.80 to 0.50. Male cerci reddish brown to black, with basal outer pale spot; in dorsal view basal 0.40 gradually widening, distal 0.30 concave; tips acuminate; inner margin bent ventrally between distal 0.30-0.50; subbasal tooth poorly developed; longitudinal dorsal crest well developed at distal 0.20 (Figs 54, 59). Female cerci lanceolate with acuminate tips; maximum width at distal 0.30 (Fig. 64).

Aeshna confusa differs from the other Patagonian species by the presence of complete pale mesanepisternal stripes and male cerci shape which in lateral view have inner margins bent ventrally and have a poorly developed subbasal tooth.



Figs 37-40. Female abdomen, lateral colour pattern: (37) *A. diffinis*; – (38) *A. confusa*, andromorph; – (39) *A. variegata*, dark form; – (40) *A. variegata*, light form. – [Scale 2 mm].

DISTRIBUTION. – Type locality: Buenos Aires (RAMBUR, 1842). BRAZIL: Rio Grande do Sul; Santa Catarina; Rio de Janeiro. URUGUAY: Montevideo; Colonia. ARGENTINA: Misiones; Tucumán; Córdoba; Entre Ríos; Santa Fé; Buenos Aires. CHILE: Santiago region: Santiago. Valparaiso region: Quillota; Valparaiso. Maule region: Curicó; Talca; Cauquenes. P a t a g o n i a: Biobío region: Ñuble: Termas de Chillán (IEUM); San Fabián de Alico (UMMZ); Nogueche (UMMZ). Concepción: Concepción (CALVERT, 1956; JURZITZA, 1989); Penco (CALVERT, 1956; JURZITZA, 1989); Dichato, El Pingueral (UMMZ). Biobío: Antuco (UMMZ). Araucanía region: Malleco: Purén (CALVERT, 1956; JURZITZA, 1989); Angol (CALVERT, 1956; JURZITZA, 1989). Cautín: Temuco (IEUM; FRASER, 1957); Nueva Imperial (CALVERT, 1956; JURZITZA, 1989). De Los Lagos region: Valdivia: Valdivia (MHNS); Valdivia, camino a los Ulmos (JURZITZA, 1989). Llanquihue: Frutillar (MHNS). Aisén region: Cohiaique: Miguel Cerdá (CALVERT, 1956).

REMARKS. – *Aeshna confusa* was described based on specimens from Buenos Aires, Argentina, and recorded by several authors from southern Chile (HAGEN, 1875; GAZULLA & RUIZ, 1928; CALVERT, 1956; JURZITZA, 1989). The Chilean specimens are smaller than the Argentinean ones (♂ body length: Argentina (N=15) 56.32 ± 2.2 [53.7-59.8]; Chile (N=7) 54.24 ± 1.6 [50.5-56.5]; ♀ body length: Argentina (N=24) 54.75 ± 2.19 [50.9-59.4]; Chile (N=10) 52.23 ± 2.35 [48.2-56.5]; ♂ cerci length: Argentina 4.26 ± 0.16 [4-4.5]; Chile: 3.98 ± 0.12 [3.8-4.2]; ♀ cerci length: Argentina 4.37 ± 0.23 [3.9-4.8]; Chile 3.3 ± 0.22 [3-3.8]). These differences seem attributable to geographic isolation between populations on both sides of the Andes. Hence, the distribution of *A. confusa* seems disjunct, with records from the Parano-Platense basin and the valdivian forest in Chile and the yungas mountain forest in Tucumán. This disjunct distribution pattern is similar to that of other animals and plants (MAURY et al., 1996) and may be the result of a vicariance event that resulted from a retreat of forest habitat during the Plio-Pleistocene. *A. confusa* is restricted to separated forest habitats and is absent from the xeric areas that extend from Brazil to the Patagonian steppe. In Patagonia, its distribution is apparently limited to forests extending to the Andes and the southern portion of the Central Chilean biogeographic province.

AESHNA VARIEGATA FABRICIUS, 1775

Figures 5-6, 13, 18-19, 24-25, 28-29, 33-36, 39-40, 45, 50, 55, 60, 65, 67-68

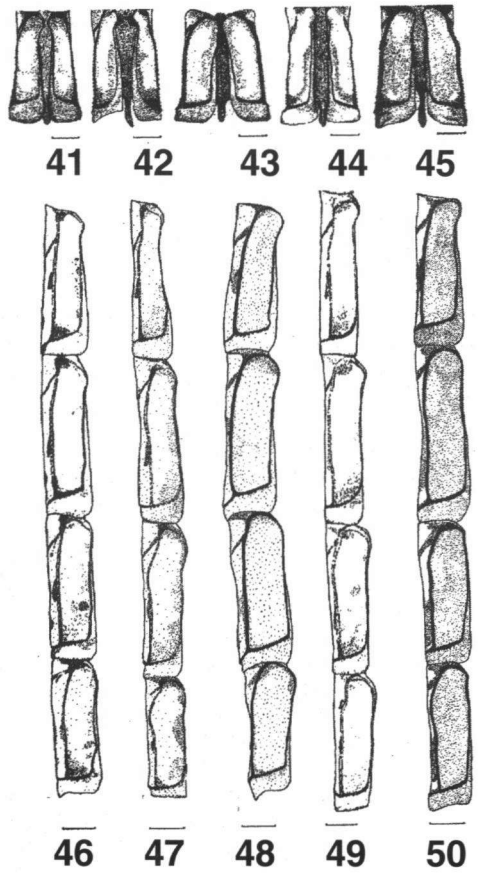
Aeshna variegata: FABRICIUS, 1775: 425 (descr., type locality: Tierra del Fuego); HAGEN, 1861: 314; HAGEN, 1875: 38; MARTIN, 1908: 44-45; MARTIN, 1911: 11; RIS, 1913: 81-84; RIS, 1918: 159, 162-163; MARTIN, 1921: 23; MARTIN, 1923: 109; NAVÁS, 1926: 103-104; CALVERT, 1952: 258; HERRERA et al., 1955-1966: 81; CALVERT, 1956: 12, 90-98, 230; pl. 35, figs. 467-477, map 3; FRASER, 1957: 159; FRASER, 1958: 195-198; BÖTTGER & JURZITZA, 1967: 37-38; figs. pls 1: 5b, 6b, 4: Ib, 6: Ia-Ib; JURZITZA, 1975: 11; PAULSON, 1977: 175; JURZITZA, 1989: 10; JURZITZA, 1990b: 385-393; RODRIGUES CAPÍTULO et al., 1991: 62; WATSON, 1992: 455, 657-462; RODRIGUES CAPÍTULO, 1992: 38, 57; PÉREZ D'A. & MUTSCHKE, 1993-1994: 63-68; fig. 1; MUZÓN, 1995: 6; MUZÓN, 1997: 127-128, 132-133; MUZÓN & VON ELLENRIEDER, 1997: 143-146, figs. 1-11; MUZÓN & VON ELLENRIEDER, 1998: 23.

Aeschna diffinis: MABILLE, 1888: 1-9; RIS, 1904: 24, 26-29 (in part: c form); MARTIN, 1908: 43-44, fig. 40 (in part: record from Tierra del Fuego); MARTIN, 1911: 11 (in part: record from Tierra del Fuego).

Aeschna diffinis var. *risi*: ENDERLEIN, 1912: 119.
Aeshna diffinis risi: DAVIES & TOBIN, 1985: 9-10.
Aeshna peralta: CALVERT, 1956: (at least in part: records from Chile and Argentina); JURZITZA, 1989: 9-10; RODRIGUES CAPÍTULO & MUZÓN, 1989a: 76; RODRIGUES CAPÍTULO et al., 1991: 62.

DIAGNOSIS. – Well developed black stripe along frontoclypeal groove; black stripe along ocular groove widening towards fronto-clypeal groove (as in Fig. 7). Mesepimeral and metepimeral stripes sinuous; mesepimeral stripes at ventral 0.75; metepimeral stripes always complete (Fig. 13). Membranule black, basal 0.50-0.30 white. Ventral terga contour as shown in Figures 45 and 50, reddish brown with pattern of light blue to yellow kidney shaped spots variable in number and extension: lacking pale spots; or with one spot from anterior 0.50 to 0.25; or with two spots one light blue anterior and another medial pale brown. Male cerci reddish brown to black; in dorsal view basal 0.40 of inner margin convex and distal 0.50 concave; tips not acuminate; subbasal tooth well developed; longitudinal dorsal crest well developed at distal 0.20 (Figs 55, 60). Female cerci lanceolate with rounded tips. Maximum width between basal and distal 0.25 (Fig. 65).

Variability in colour occurs between specimens from the forest (dark form), the steppe (light form) and the Chilean central region (intermediates). No structural differences are found between the light and dark forms. Dark form: T on postfrons wide; dark yellow spot on each side of the stem of T as wide as 0.50 the stem width (Fig. 5); mesanepisternal stripe present in 19% of males and 5% of females, at ventral 1.8;



Figs 41-50. Abdominal terga, ventral view: [41-45 males]: (41) *A. absoluta*; – (42) *A. bonariensis*; – (43) *A. diffinis*; – (44) *A. confusa*; – (45) *A. variegata*. – [46-50 females]: (46) *A. absoluta*; – (47) *A. bonariensis*; – (48) *A. diffinis*; – (49) *A. confusa*; – (50) *A. variegata*. – [Scale 1 mm].

ventral part of metepimeron with a yellow central spot only in 2% of specimens; veins black but C and subnodal dark reddish brown and Sc and R_1 reddish brown between wing base and nodus; PL absent on abdominal segments III-VII; wing reticulation dense (Fig. 18, Tab. II). Light form: T-spot narrowing gradually towards top arm; yellow spot on each side of stem of T as wide as the stem at base (Fig. 6); mesanepisternal stripe present in 61% of males and 67% of females, at ventral 0.25 to 0.50; ventral part of metepimeron with a yellow central spot in 96% of specimens; veins black but C and subnodal yellow, antenodals and nodal light yellow, and Sc and R_1 pale brown between wing base and nodus; PL wide on abdominal segments III-IX; wing reticulation less dense (Fig. 19, Tab. II). Intermediates: T-spot with sides approximately parallel or narrowing gradually distally; pale mesanespisternal stripes absent; C pale brown from base to nodus, then dark brown to pterostigma; PL absent (40%) or reduced to a narrow spot against posterior margin (60%).

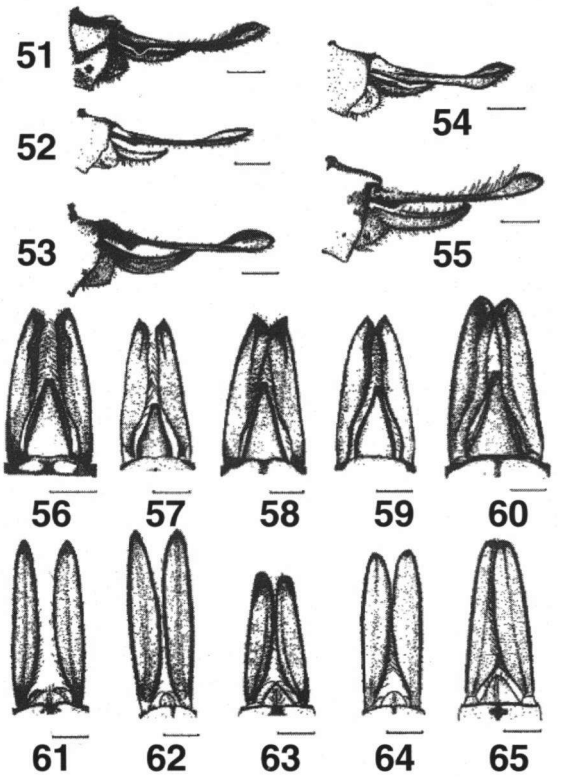
A. variegata differs from the other *Aeshna* species from Patagonia in the sinuous contour of the pterothoracic pale stripes, abdominal colour pattern in lateral view and shape of male cerci in dorsal view.

DISTRIBUTION. – Type locality: Tierra del Fuego (FABRICIUS, 1775).

Dark form: ARGENTINA: Patagonia: Río Negro: lago Nahuel Huapi (MUZÓN, 1995); lago Mascardi (MLP; MUZÓN, 1995). Neuquén: Nahuel Huapi (CALVERT, 1956); P.N. Nahuel Huapi, lago Traful, Puerto Arrayanes (FML); P.N. Nahuel Huapi, río Pichi-Traful (FML); P.N. Nahuel Huapi, lago Villarino (MLP; MUZÓN, 1995); P.N. Lanin, Termas del Queñi, lago Queñi (MLP); P.N. Nahuel Huapi, lago Queñi (MLP); P.N. Lanin, Termas de Lahuen-Có (MLP); P.N. Lanin, Ayo. Quechuquina (MLP); San Martín de los Andes (MUZÓN, 1995); lago Lacar, Yuto (MUZÓN, 1995); lago Escondido (MUZÓN, 1995); lago Paimún (MLP); Ayo. Malleo (MLP); lago Aluminé (MLP). Chubut: cerro Chall-huaco (MUZÓN, 1995); 20 km W Alto Río Senguerr, camino lago Fontana (FML); P.N. Los Alerces, laguna Verde (MLP; MUZÓN, 1995); Intendencia (MLP; MUZÓN, 1995; MUZÓN & VON ELLENRIEDER, 1997); P.N. Los Alerces, Puerto Mermond (MUZÓN, 1995). Santa Cruz: lago Argentino, Calafate (FML); lago Argentino, Brazo Rico (FML); lago Argentino, Brazo Onelli (FML; FRASER, 1958; MUZÓN, 1995); lago del Desierto (MLP). Tierra del Fuego: Bahía Buen Suceso (MLP); Puerto Harberton (FML; RIS, 1904); P.N. Tierra del Fuego, Bahía Lapataia, Arroyo Los Castores (MLP; MUZÓN, 1995); P.N. Tierra del Fuego, charca de desborde río Ovando (MLP; MUZÓN, 1995); Ushuaia, turbera con chorrillo cerca de río Pipo (MLP); ruta 3, 3 km N río Tristén (MLP; MUZÓN, 1995); Ushuaia, laguna del Diablo (MLP; MUZÓN, 1995); ruta a lago Fagnano, camino a las Termas (MLP); ruta a lago Fagnano, camino a las Termas(MLP); laguna Escondida (MLP); Margen S lago Fagnano (MLP; MUZÓN, 1995); ruta J, lago Victoria (MLP; MUZÓN, 1995); Lagotowia; Admirality Sound, río Azopardo (RIS, 1913); camino a Estancia Harberton (MUZÓN, 1995). CHILE: Patagonia: Biobío region: Ñuble: Las Trancas (MHNS; JURZITZA, 1990b). Concepción: Concepción (RIS, 1918); río Biobío cerca de Concepción (JURZITZA, 1989; 1990b). Arauco: Contulmo (IEUM); Butamalal, Hacienda S Pichinahuel (UMMZ); Pillim-Pilli, cordillera de Nahuelbuta (UMMZ); Caramávida (UMMZ); aprox. 5 km E Caramávida, charcas con juncos junto al río Caramávida (MLP). Araucanía region: Malleco: Termas Río Blanco (IEUM); Termas de Manzanar (MHNS); Termas de Tolhuaca, Curacautín (UMMZ); Las Raices (JURZITZA, 1990b); Angol (UMMZ; CALVERT, 1956; JURZITZA, 1989); Cordillera de Nahuelbuta, camino Piedra del Aguila-Cayucupil (MLP); Cordillera de Nahuelbuta (UMMZ; JURZITZA, 1990b); río Cajón (JURZITZA, 1990b); Alto Nahuelbuta (UMMZ). Cautín: Termas de Palguín (IEUM). De Los Lagos region: Valdivia: Los Alerces, W La Unión (JURZITZA, 1990b); Valdivia (MLP; MHNS; BÖTTGER & JURZITZA, 1967; JURZITZA, 1975; 1989; 1990b); Neltulme (UMMZ; JURZITZA, 1990b); Arroyo de piedras junto a camino Mehuin-Queule (MLP). Osorno: camino Hueyusca-Bahía de San Pedro (MLP); Cordillera, Aguas Calientes, Volcán Antillanca (JURZITZA, 1975; 1989; 1990b); Pucatrihue (UMMZ); Puente

"El Avión", camino Pucatrihue-Bahía Mansa (MLP); Ayo. bifurcación camino Pucatrihue-Bahía Mansa (MLP); P.N. Puyehue, Antillanca (MHNS); Aguas Calientes, cerca de Antillanca (JURZITZA, 1989); P.N. Puyehue, laguna El Toro (MHNS); Port Puyehue (UMMZ); cerca de Port Puyehue, río Gol-Gol (UMMZ). Llanquihue: Puerto Montt (UMMZ); Ensenada (UMMZ); lago Chapo (JURZITZA, 1990b); Frutillar (IEUM). Chiloe: Dalcahue (UMMZ); Ancud (UMMZ); Ancud, Calle (IEUM); Ancud, Guabún (IEUM). Palena: Puerto Ramirez, río Futaleufú (MLP); lago Lonconao (MLP; MUZÓN & VON ELLENRIEDER, 1997); Chaitén (UMMZ); Chaitén, río Amarillo (UMMZ). Aisén region: Aisén: laguna San Rafael, El Arrastradero (MHNS); laguna San Rafael, ladera Norte (MHNS); laguna San Rafael, lago Ventisquero (MHNS); Puerto Aisén (MLP; JURZITZA, 1990b); Puerto Aisén, charca con mallín 5 km S lago Riesco (MLP); río Riesco (JURZITZA, 1990b); Puerto Aisén, Termas de Chilconal (MLP); Puerto Aisén, Presidente San Carlos (MLP); Carretera Austral 7 km S Villa Mañiguales (MLP); 4,5 km E Puerto Cisnes (MLP); Puyuhuapi (MHNS); P.N. Queulat (MLP; MUZÓN & VON ELLENRIEDER, 1997); Sur La Junta (JURZITZA, 1990b); Valle de Solar (MHNS). Coihaique: lago Elizalde, Rayutue (MHNS); Coihaique (MHNS); 3 km N Ñireguao (MLP); laguna P. Aguirre Cerdá, 2 km S desvío Mina El Toqui (MLP); 20 km S Villa Amengual, Carretera Austral (MLP); Carretera Austral, 4 km S Puente El Lobo, 13 km S desvío a Puerto Cisnes (MLP); Villa La Tapera (MLP). General Carrera: río Murta (JURZITZA, 1990b); 19 km N de Puerto Ibañez (MLP). Capitán Prat: Harbour Island, Canal Messier (CALVERT, 1956; JURZITZA, 1989); Cochrane (JURZITZA, 1990b). Magallanes region: Última Esperanza: cerro Castillo (IEUM); Dos Lagunas, Hosteria Patagonia Inn (MLP); cerro & río Payne (UMMZ); El Paine (MHNS); P.N. Torres del Paine (MHNS); lago Nordenskjöld (MHNS); cerro Guido, laguna Amarga, río de Las Chinas (UMMZ); laguna Amarga (MHNS); Última Esperanza (RIS, 1913). Magallanes: San Juan (MHNS); 15 km S Punta Arena (UMMZ); 4 km S Punta Arena (UMMZ); Punta Arena (RIS, 1904; RIS, 1913); Punta Arena, Ojo Bueno (MHNS); Punta Arena, Parcela (MHNS); río Tres Brazos (WATSON, 1992); Chabunco (IEUM); Instituto de La Patagonia (MHNS); río Rabona (MHNS); Fiordo Resi (MHNS); laguna Timone (MHNS). Tierra del Fuego: Isla Clarence, Sholl Bay, Canal Magdalena, S Estrecho de Magallanes (NAVÁS, 1916); Cabo de Hornos (MABILLE, 1888).

Light form: PERU: Puno;



Figs 51-65. Cerci: [51-55 male, lateral view]: (51) *A. absoluta*; – (52) *A. bonariensis*; – (53) *A. diffinis*; – (54) *A. confusa*; – (55) *A. variegata*. – [56-60 male, dorsal view]: (56) *A. absoluta*; – (57) *A. bonariensis*; – (58) *A. diffinis*; – (59) *A. confusa*; – (60) *A. variegata*. – [60-65 female, dorsal view]: (61) *A. absoluta*; – (62) *A. bonariensis*; – (63) *A. diffinis*; – (64) *A. confusa*; – (65) *A. variegata*. – [Scale 1 mm].

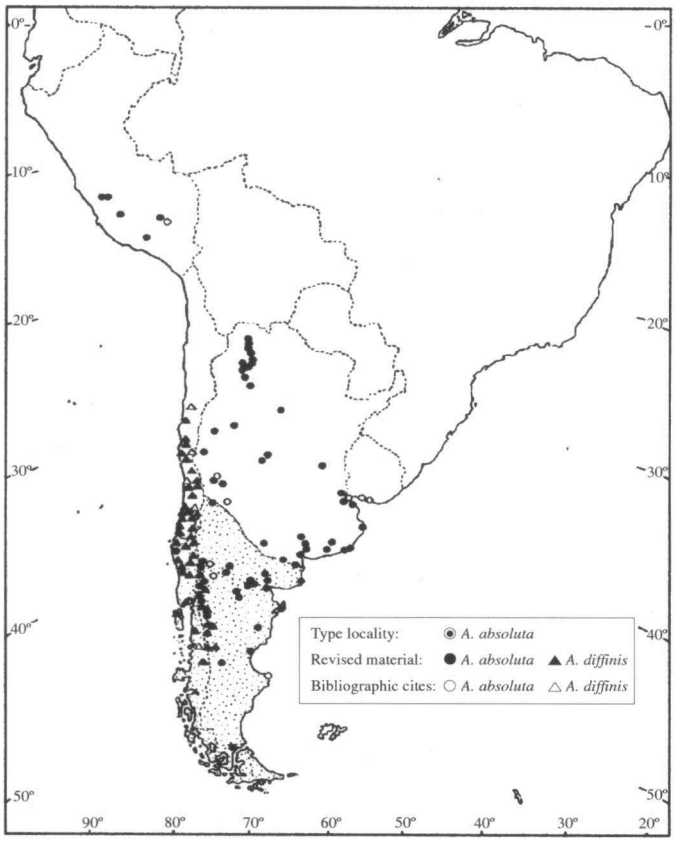


Fig. 66. Geographic distribution of *Aeshna absoluta* – *A. diffinis*. – [Dotted: Patagonia].

Chimo; Camacani; La Huerta. ARGENTINA: Jujuy; Salta; Mendoza. Patagonia: Río Negro: Ayo. El Caín, camino a Ruca Choroy (MLP); laguna Cari Laufquen Chica (MLP); Rt. 23, 16 km E C. Onelli (MLP); Rincón de Comi-Có (MLP); Ayo. Comi-Có, Comi-Có (MLP); Vertiente Ea. El Rincón (MLP; FML); Chipauquil, Ayo. Valcheta (MLP; RODRIGUES CAPÍTULO & MUZÓN, 1989a; MUZÓN, 1995); Valcheta (MLP), Ramos Mexia (MLP). Santa Cruz: El Calafate, río Calafate (MLP); El Calafate, Ayo. Los Perros (MLP; MUZÓN, 1995); Ayo. s/n al S de Perito Moreno (MLP; MUZÓN, 1995); Tres Lagos (MLP); lago Buenos Aires (FML). Chubut: Shaman, Ayo. Shaman, ruta 40, 3 km S de Shaman (MLP). CHILE: Antofagasta region: El Loa, Antofagasta. Patagonia: Magallanes region: Magallanes: Estancia Brazo Norte (IEUM; MHNS; PDA; PÉREZ D'ANGELLO, 1993-1994).

Intermediates: Coquimbo region: Limarí; Choapa. Santiago region: Chacabuco; Santiago; Cordillera. Valparaiso region: Quillota; San Felipe de Aconcagua; Valparaiso; San Antonio. Maule region: Curicó; Linares; Talca. Libertador Gral. Bernando O'Higgins region: Colchagua; Cachapoal.

REMARKS. – *Aeshna variegata* was described from a single male from Tierra del Fuego. MABILLE (1888) provided a long description of this species along with colour plates of male and female. RIS (1904) recorded it from Punta Arenas as *A.*

diffinis "c" form, and later (RIS, 1913; 1918) extended its known distribution from Tierra del Fuego to Concepción (Chile). CALVERT (1956) recorded it from Argentina and Bolivia, and FRASER (1958) redescribed the male and female based on specimens from Brazo Onelli, Lago Argentino (Santa Cruz, Argentina). MUZÓN & VON ELLENRIEDER (1997) described the last larval instar.

Aeshna peralta was described by RIS (1918) based on specimens from Apurimac (Peru) and La Paz (Bolivia). CALVERT (1956) recorded it from Ecuador, Peru, Chile, Argentina and Brazil, but did not examine type material. He probably included more than one species under this name: at least *A. variegata* and a second species from Brazil (specimens from Brejo da Lapa, Rio de Janeiro, deposited at Museo de Rio de Janeiro, examined by the author) however he apparently did not have true *A. peralta* at his disposal. *A. peralta* was recorded from Patagonia by RODRIGUES CAPÍTULO & MUZÓN (1989a) and JURZITZA (1989) from several localities of Chile, following CALVERT's (1956) diagnoses and key. JURZITZA (1990b) proposed its synonymy with *A. variegata* based on characters mentioned by CALVERT (1956) which included the number of cell rows between IR_{2a}-IR_{2b} and characters of the male secondary genitalia, and not on characters in RIS' original description (1918). I have not yet been able to see *A. peralta* types, and no specimen that fits Ris' description is among the examined material. JURZITZA (1990b) did not examine the types either. Although the specimens previously determined as *A. peralta* on which he based the synonymy are in fact *A. variegata*, I believe that a comparison with the types of *A. peralta* is required in order to confirm the synonymy since the characters mentioned in the description of *A. peralta* (RIS, 1918) differ from those of *A. variegata*. According to its original description, *A. peralta* is smaller than *A. variegata*. For example the values of wing length and width, frons width and cerci length are smaller than those tabulated for *A. variegata* in the present study. The abdominal colour pattern (PD and PL widely confluent in segments III-IX of *A. peralta*) and male cerci shape are also different. As shown by Ris' drawing, in *A. peralta* the dorsal crest of male cerci is lower, the widening of cercus base is abrupt, and the medial margins are parallel along distal 0.50. In *A. variegata* the dorsal crest is higher, the base of the cercus widens more gradually and the medial margins are concave along distal 0.50. Due to these uncertainties, I have refrained from including *A. peralta* as a synonym of *A. variegata*.

A. variegata has been considered as a highly variable species; sensu JURZITZA (1990b), its wing reticulation becomes gradually thicker and its colour darker with increasing latitude and decreasing altitude. I observed geographic variation in colour pattern and wing venation but it did not follow a smooth gradient. The dark form of *A. variegata* occurs along a narrow area of the subantarctic forest in Chile and Argentina (Subantarctic biogeographic province) from Tierra del Fuego in the South to the 36.5°S in Chile. The light form is distributed in the Patagonian steppe and in other dry areas of Argentina, Peru and northern Chile. Intermediate specimens occur within an area that approximates the Central Chilean biogeographic province, a zone

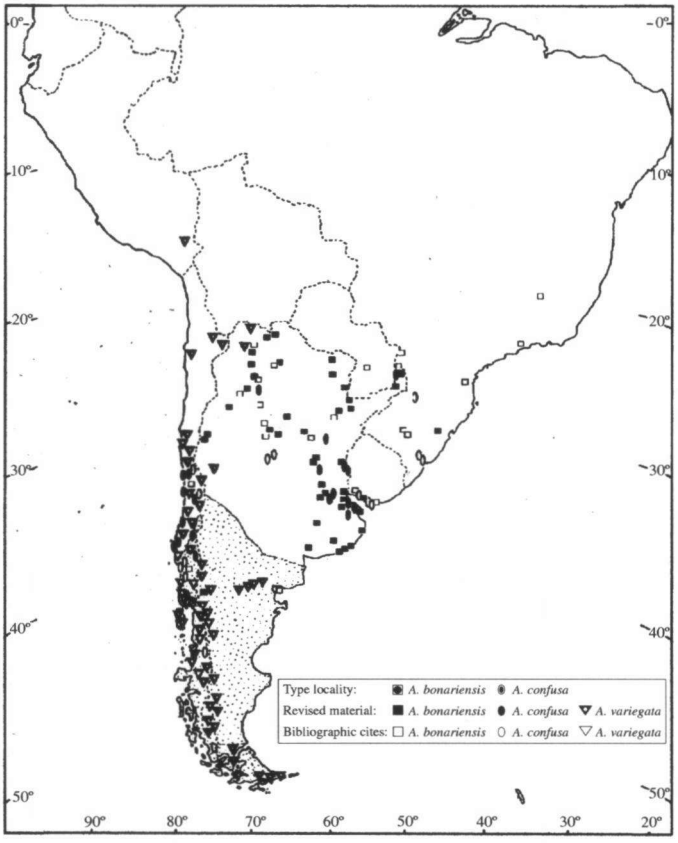


Fig. 67. Geographic distribution of *Aeshna bonariensis*, *A. confusa* and *A. variegata*. – [Dotted: Patagonia].

of intermediate aridity (350-1330 mm average yearly rainfall) between that of the humid subantarctic forest (2000-3500 mm) and the xeric region of Northern Chile and the Patagonian steppe (0-100 mm and 100-270 mm respectively). The abrupt geographic change in the colour pattern and wing reticulation could be a "step cline" (LANE & MARSHALL, 1981), and seems to be concordant to relative humidity instead of latitude or altitude.

The distribution of the light form of *A. variegata* approximates that of *A. absoluta*. However, they rarely seem to be sympatric since *A. variegata* occurs at higher elevations while *A. absoluta* largely replaces it at lower elevations.

CONCLUDING REMARKS

Examination of nearly 2000 specimens of *Aeshna* confirms the presence of five

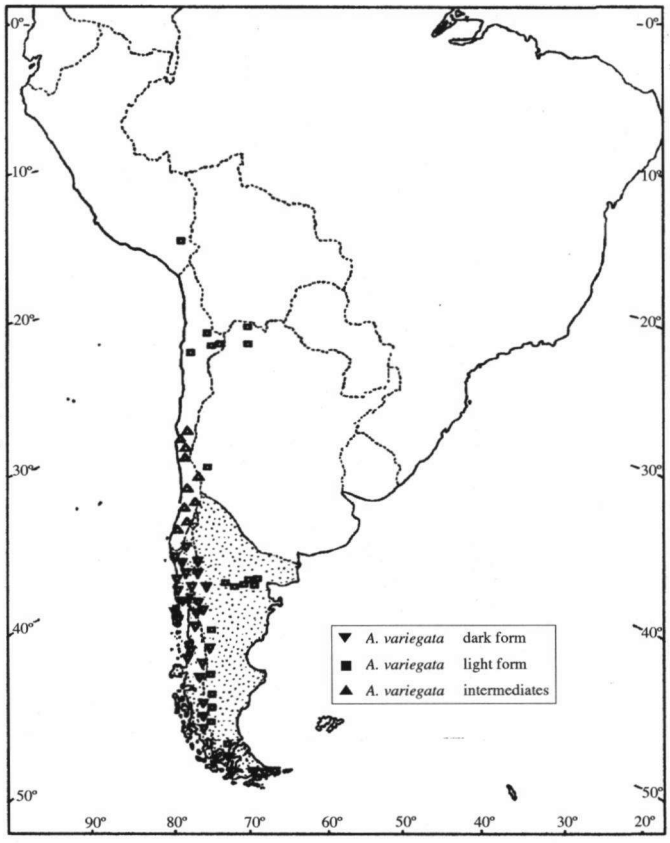


Fig. 68. Geographic distribution of *Aeshna variegata*: dark and light forms and intermediates. – [Dotted: Patagonia].

species recorded from Patagonia: *A. absoluta*, *A. diffinis*, *A. confusa*, *A. variegata* and *A. bonariensis*, although the latter is supported by only one Patagonian locality. Previous records of *A. elsia* and *A. peralta* are probably based on misidentifications. *A. elsia* has been found only in collections from Peru and northern Chile (Antofagasta region); CALVERT's (1956) record from Patagonia referred to some other species than *A. elsia* since he mentioned for this particular specimen the presence of a black stripe on the frontoclypeal groove; this stripe is absent in *A. elsia* (VON ELLENRIEDER, 2000).

Several characters previously used to identify the *Aeshna* species from Patagonia are shown in this study to be intra- and interspecifically variable and are, therefore, of little diagnostic value. These include extension of pale pterothoracic stripes, pterostigma colour, extension of pale ventral terga areas and hamuli shape. The contour of ventral abdominal terga varies specifically allowing identification of

similar species (i.e. males of *A. absoluta* and *A. diffinis*). Colour pattern of the abdomen used by WALKER (1912) to characterise North American *Aeshna* species is useful in identifying some species. *A. bonariensis* and *A. confusa* females are dimorphic with andromorph and heteromorph forms. Female colour patterns in the remaining species differs slightly from that of the male. Shape of the cerci allows separation of species pairs both in males and females. Wing venation characters used to identify several *Aeshna* species from the Nearctic region (PETERS, 1997), including origin of IR_2 fork and IR_1 between pterostigma and IR_2-fork, not diagnostic. Density of wing venation varies between species, but is not specifically characteristic. Generally, members of the subgenus *Hesperaeschna* (*A. confusa* and *A. variegata*) have a denser wing venation than those of *Neureclipa* (average number of cells in triangle, crossveins in cubital space, number of cells and cell rows of anal loop, Tab. II, Figs 14-19).

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