by always having the submarginal series on the ventral surface composed of single dashes, rather than paired spots, between the veins; this character is especially noticeable in cell M₁ on the forewing. Fruhstorfer (1915) placed A. paraena as a subspecies of A. serpa, but following the rearing experiments of Moss (1933), Hall (1938) correctly reinstated A. paraena as a full species, as which it has subsequently been regarded by most authors. However, on account of the confusingly similar dorsal pattern, A. paraena massaia has been placed as a subspecies of A. serpa (DeVries, 1987; Lamas and Small, 1992), or completely synonymised with A. serpa celerio (Hall, 1938), and it was only recently that Neild (1996) correctly placed it as the Central American subspecies of A. paraena.

The various subspecies of the remaining four species have been placed in numerous combinations by previous authors. Fruhstorfer (1915) separated A. seripa and A. serpa (as A. celerio), and with the exception of syrma and godmani, which he treated as forms of subspecies of A. celerio, he correctly associated all the then known taxa with each species. Fruhstorfer (1915) however associated both A. hyas and A. radiata with A. serpa as forms or subspecies, despite the stability of phenotypes in each taxon and apparent sympathy, though the rarity of A. radiata radiata somewhat justifies his decision. Hall (1938). In his influential review of Fruhstorfer names, followed the rather extreme course of regarding all the described taxa of A. hyas, A. serpa, A. seripa and A. radiata as forms of a single species, A. serpa. Workers in South America varied in their treatment of nominate A. hyas, either following Fruhstorfer (1915) and Hall (1938) in regarding it as a subspecies or form of A. serpa (Hayward, 1973), or treating it as a distinct species (Hoffmann, 1937; Bzieanko et al., 1978; Brown, 1992).

DeVries (1987) made no mention of A. seripa godmani occurring in Costa Rica, while Lamas and Small (1992) retained A. seripa and A. serpa as separate species with some reservations that they might prove to be elevational forms. Neild (1996) treated A. seripa and A. serpa celerio as good species, and also correctly noted that godmani represented Central American A. seripa. Although A. seripa godmani and A. serpa celerio are very similar, they can be distinguished by several characters, the first three of which are diagnostic for each species (with the exception of A. serpa serpa) throughout its range: A. seripa has the blocks of the white postdiscal band on the dorsal forewing displaced slightly diagonally, whereas in most A. serpa taxa they are arranged more vertically; the orange subapical marking on the forewing of A. seripa is oriented vertically, in A. serpa it is more horizontal; on the ventral hindwing the orange band distal to the white postdiscal band is straight in A. seripa, but convex in A. serpa, while the inner submarginal series is roughly parallel with this band in A. serpa but noticeably closer to the band in cell M₁, and Rs in A. seripa. Throughout the eastern Andes there is little difficulty separating A. seripa and A. serpa, and the two species also appear to occupy exclusive elevational ranges, with A. seripa occurring at higher elevations. A. serpa serpa is similar in several respects to Central American A. seripa, but as the Bolivian A. seripa seripa therasia appears to be very distinct, and as the species occurs only at fairly high elevations in the eastern Andes, we do not believe that A. serpa serpa and A. seripa are conspecific. We regard A. s. serpa as being conspecific with remaining A. serpa taxa on the basis of close allopatry and specimens from Paraguay in the BMNH that are phenotypically intermediate between A. s. serpa and the Amazonian A. serpa diadocus (the latter was regarded as conspecific with A. s. celerio by Fruhstorfer (1915)).

Except for the nominate subspecies of each, both A. hyas and A. radiata contain some very rare taxa and therefore have been taxonomically poorly understood. East Andean A. hyas (viracocha and hewitsoni) closely resemble A. seripa, but are usually smaller, lack the dark orange outer postdiscal series dashes on the ventral forewing in cells 1A+2A-Cu₁, have ventral hindwing characters typical of A. serpa and have the base of the ventral forewing costa white, not red. These characters link nominate A. hyas with A. h. viracocha and A. h. hewitsoni. A. radiata has a ventral pattern similar to A. serpa, but in all subspecies (except myrella) lacks a well developed white spot at the base of cell Cu₁ on the dorsal forewing. A. radiata myrella resembles A. serpa serpa on the dorsal surface, but like A. radiata radiata has the hindwing submarginal series split by dark rays between each pair of veins.

Below we present a synonymic checklist of Adelpha serpa and the related species discussed here (taxa considered infrasubspecific are preceded by a "-"):

**Adelpha serpa** (Boisduval, 1836)

- **celerio** (H. W. Bates, 1864) (Mex.-N.W. Ven.) **rev. stat.**
  - diadema Fruhstorfer, 1913
  - phintias Fruhstorfer, 1913
- **dulliata** Fruhstorfer, 1913 (W. Ecuad.)
  - diadocus Fruhstorfer, 1915 (Ven.-Bol., Braz. [Amaz.], Guianas) **n. stat.**
  - timekhi Hall, 1938 **n. syn.**
  - florea Brévignon, 1995 **n. stat.**
  - serpa (Boisduval, 1836) (S.E. Brazil-Parag., N.E. Arg.)
  - damon Fruhstorfer, 1913
  - ornamenta Fruhstorfer, 1915

**Adelpha hyas** (Doyère, 1840)

- hewitsoni Willmott & Hall, n. sp. (E. Ecuad.)
- viracocha Hall, 1938 (C. Peru-Bol.) **n. stat.**
- hyas (Doyère, 1840) (S.E. Brazil-Urg.)

**Adelpha seripa** (C. & R. Felder, 1867)

- godmani Fruhstorfer, 1913 (Mex.-W. Ecuad.)
- syrma Fruhstorfer, 1915 **n. stat.**
- egregia Röber, 1927 (Col. [Sant. Marí]) **n. stat.**
- seripa (C. & R. Felder, 1867) (Ven. [Cord. de la Cost])
  - pione Godman & Salvins, 1884 (Ven. [Mérida]-Col. [Cord. Occ. N. de Bogotá])
  - aquilina Fruhstorfer, 1915 (Col. [Cauca, Cord. Cen. and Occ. S. of Bogotá]-C. Peru)
  - nacry Fruhstorfer, 1915 **n. stat.**
  - therasia Fruhstorfer, 1915 (S. Peru-Bol.)
  - n. sp. Willmott, prep. (Trinidad)

**Adelpha radiata** Fruhstorfer, 1915

- atelae Willmott & Hall, n. sp. (C. Pan.-W. Ecuad.)
- gilletella Brévignon, 1995 (F. Guianas) **n. stat.**
- explicator Willmott & Hall, n. sp. (E. Ecuad.)
- myrella Fruhstorfer, 1915 (S.E. Brazil [Esp. Sant.-Rio de J.]) **n. stat.**
- radiata Fruhstorfer, 1915 (S.E. Brazil [Rio de J.-Sant. Cat.]) **n. stat.**

**Adelpha paraena** (H. W. Bates, 1865)

- massaia (C. & R. Felder, 1867) (Mex.-W. Pan.)
  - n. sp. Willmott, prep. (E. Pan.-W. Col.)
  - reyi Neild, 1996 (N.W. Ven.)
- paraena (H. W. Bates, 1865) (Ven.-Bol., Braz., Guianas)

**Adelpha hyas hewitsoni** Willmott & Hall, new sp.

Fig. 8a-b; 18

**Description.**—**Male:** forewing length 27mm; forewing slightly falcate, hindwing with dentate distal margin. **Dorsal surface:** Forewing: ground color dark blackish brown; orange-brown scaling at very base of discal cell at posterior edge of costal vein; two black lines in discal cell with red scaling below near costa, a red bar over the discocellulars; line of white postdiscal blocks extending from anal margin to cell Cu₁, that in
relatively straight and with a small internal selerotised pad bearing tiny spines; saccus deep.

**FEMALE**: differs from male as follows: forewing length 28mm; wings broader and more rounded. **Dorsal surface**: Forewing: ground color paler; submarginal series paler and more prominent; postdiscal white spots larger; pale postdiscal dashes in cells M₃-M₄. **Hindwing**: ground color paler; white postdiscal band broader and more rounded near tornus; outer postdiscal series visible as a pale brown line on hindwing; submarginal series paler and more prominent. **Ventral surface**: Forewing: postdiscal spots larger; submarginal series broader. **Hindwing**: white postdiscal band as on dorsal surface; orange bands surrounding white postdiscal band broader and paler; submarginal series broader.

**Types**. **Holotype**: ECUADOR.—Napo Prov.; nr. Talag, Rio Jatunyacu, Pimpililara, 600m, 14-15 Sep 1996 (K. R. Willmott) (to be deposited in the BMNH).

**Allotype**: ECUADOR.—Napo Prov.; km. 20 Tena-Puyo rd., Apunya, 600m, 10 Oct 1996 (K. R. Willmott) (to be deposited in the BMNH).

**Paratypes**: ECUADOR.—Napo Prov.; 1 δ: same data as HT (in the MNHN); 1 δ: same data as HT except 17 Apr 1995 (J. P. W. Hall) (KWHJ); 1 δ: same data as HT except 16-17 Sep 1995 (F. E. Nield) (to be deposited in the USNM); 1 δ: same data as HT except 20 Oct 1996 (KWHJ); 1 δ: same data as HT except 30 Aug 1997 (KWHJ); 1 δ: Pasteza Prov.; Rio Llindaza, km. 25 Puyo-Tena rd., San José, 950m, 10 Sep 1993 (J. P. W. Hall) (to be deposited in the AME).

**Etymology**. This subspecies is named for William Chapman Hewitson, who described more species of Adelpha than any other worker, and who showed a far greater understanding of the important wing pattern characters in the genus than most who succeeded him.

**Diagnosis**. *Adelpha hyas* consists of three known subspecies, *Adelpha h. hyas*, *Adelpha h. viracocha*, and *A. h. Hewitsoni* n. sp. Both previously described subspecies differ from *A. hyas Hewitsoni* in having the submarginal series on the ventral hindwing (and ventral forewing, though less noticeably) greatly enlarged and fused so that no individual markings are evident between the veins; the submarginal series also almost blend with the orange band of the outer postdiscal series on the ventral hindwing. *Adelpha seriphia aquillia* is also very similar, but has thinner white postdiscal bands on the dorsal surface, the base of the ventral forewing costa is orange instead of white, and on the ventral hindwing the orange band of the outer postdiscal series is straight rather than convex and the markings of the inner submarginal series are wider. *A. serpi diadochos* differs by not having dark lines intruding into the pale submarginal marking on the ventral forewing and having a larger white spot in *Cu*, on the dorsal forewing. Symmetric subspecies of *A. radiata* and *A. paraena* lack a white spot in cell *Cu*, on the dorsal forewing.

**Discussion**. There is some variation in the amount of subapical orange in cell *Cu*, on the dorsal forewing, which may be absent or almost extend to vein *Cu*.

*Adelpha hyas Hewitsoni* is to date known only from a few localities at the base of the east Ecuadorian Andes, from 600-950m. It is sympatric with *Adelpha paraena paraena*, *Adelpha radiata expiator* n. sp. and *Adelpha serpi diadochos*, while *Adelpha seriphia aquillia* also occurs in the east Ecuadorian Andes, but at higher elevations (1600-1800m). Males of *A. hyas Hewitsoni* are typically encountered in groups in large (20-30m wide), old forest clearings along streams and rivers. Usually they perch from 1200-1300h in bright sun on the tops of bushes 5-6m high, making sorties out and returning to the same perch. At the type locality, Pimpililara, the species seems to be present year round in a particular coffee orchard, where it is often the most common perching *Adelpha*. Other species that resemble it on the dorsal surface and with which *A. hyas perches* include *Adelpha iphicleia thessallia* n. sp., *Adelpha thoasa manilia* and *Adelpha serpi diadochos*. The single known female was flying in heavily disturbed ridgetop forest around midday, at a site where males have yet to be recorded.
Given its locally common nature and the ease of access to its preferred microhabitat, the absence of this new subspecies in all collections studied by the authors is peculiar. The recently described species Adelpha shara Willmott & Hall, 1995, which perches with A. hyas, is also unrepresented in most major collections and locally common in similar microhabitats (Willmott and Hall, 1995). A. hyas viracocha is also rare in collections, only 8 specimens having been examined, while the nominate subspecies appears to be not uncommon.

Adelpha radiata explicator Willmott & Hall, new ssp.

Fig. 9a,b, 19

Description.—MALE: forewing length 28mm; forewing slightly falcate, hindwing with slightly denticate distal margin. Dorsal surface: Forewing: ground color dark blackish brown; orange-brown scaling at very base of discal cell at posterior edge of costal vein; two black lines in discal cell with red scaling in anterior half, a little red scaling over anterior half discocellulars; white postdiscal band extending from anal margin to cell Cu₁, block in cell Cu₂, oval and extending slightly distally from band in cell 1A+2A, only touching vein Cu₁ for a short distance; large orange subapical marking in shape of an irregular pentagon, in cells M₁, M₂, M₃, and R₄, one side broadly bordering vein M₁, basal side straight and angled steeply to costa, one distinct edge parallel to distal margin, the other angled towards costa, a rectangular orange postdisclial marking in cell Cu₂, around 2/3 size of orange in cell M₁; very sparse orange scaling in anterior half of cell Cu₂; all veins within subapical marking distinctly lined with dark brown; very faint, pale gray paired spots of inner submarginal series visible, most obvious in cells 1A+2A and Cu₂; fringe dark brown. Hindwing: ground color dark blackish brown; white postdiscal band extending from costa widening to broadest point in cells M₁ and M₂, then tapering slightly to end roundly at vein 1A+2A near tornus; tiny orange spot at tornal end of white postdiscal vein; very faint, pale gray paired spots of inner submarginal series just visible; fringe dark brown. Ventral surface: Forewing: ground color dark brown; base of costa white; discal cell bars black, first cell bar convex, second cell bar “w”-shaped, third cell bar “v”-shaped dividing space between second and fourth cell bars into three, fourth cell bar slightly convex, postcellular bar slightly concave; discal cell ground color silverly white, basal stalk absent, reddish orange between first and second cell bars and between fourth and postcellular bar; base of cell 1A+2A white, then thin black line, then white with slight red tinge, then thin black line, then whitish, then black line followed by white postdiscal block similar to dorsal surface; white postdisclial marking in cell Cu₂ as on dorsal surface; small bluish white spot distal to postcellular bar in cell M₂; anterior postdisclial band represented by faint, whitish postdisclial markings which merge into subapical marking; very pale orange subapical marking reflecting that on dorsal surface in cells M₁, M₂, M₃, and R₄ marking in cell Cu₂ as on dorsal surface; sparse whitish scales in anterior half of cell Cu₂, just distal to white postdisclial band; inner and outer submarginal series composed of paired silvery white dashes in each cell, inner series almost invisible in cells Cu₂, anterior half of cell M₁, and posterior half of cell M₂, outer series almost invisible except in cells 1A+2A, posterior half of cell Cu₂, and cell M₁; fringe dark brown. Hindwing: ground color dark brown; basal area and all of anal margin to vein 3A white, with a black line from base across distal half of humeral vein to costa; black postbassal line from just anterior to vein Sc+R, through middle of discal cell then extending along vein 3A to anal margin; broad orange band distal to preceding black line from costa to anal margin, bordered distally by thin black line crossing discocellulars; white postdisclial band as on dorsal surface; inner postdisclial series absent, outer postdisclial series a slightly uneven orange band thinning from costa to tornus and cut by dark venes, almost touching white postdisclial band at costa then curving gently away from wing base to end at anal margin, where band broadens and joins inner orange band; submarginal series entire and consisting of paired, roughy oblong flecks in each cell, those of inner series largest at apex and thinning towards tornus, inner series almost parallel to orange band of outer postdisclial series; fringe dark brown. Head, Thorax and Abdomen similar to A. hyas hewitsoni, but legs with entire ventral surface white. Gentilia (Fig. 19): similar to A. hyas hewitsoni.

FEMALE: unknown.

Types.—Holotype: ECUADOR.—Napo Prov.: km. 13 Puyo-Tena rd., Finca San Carlo, 600m, 7-8 Sep 1996 (K. R. Willmott) (to be deposited in the BMNH).

Etymology.—The name is derived from the Latin noun “explicator”, meaning an explicator, with reference to the importance of this taxon in clarifying relationships between taxa in the Adelpha serpa group.

Diagnosis.—Adelpha radiata consists of five known subspecies, A. r. radiata, A. r. myriea, A. r. gillettia, A. r. explicator n. ssp. and A. r. aiicella n. ssp. (see Discussion above). A. r. explicator differs from A. r. aiicella as detailed in the Description of the latter. Most noticeable in A. r. aiicella is the shape of the orange subapical marking on the dorsal forewing, which is broader, paler and cut by paler veins, and the presence of the orange markings of the outer postdisclial series on the ventral forewing. A. r. gillettia has, on the dorsal forewing, an additional orange block in cell Cu₂, a wider orange block in cell Cu₂, and a wider subapical marking with the veins that cross it only faintly lined with black, and the white postdiscal band is narrower, especially the spot in cell Cu₂. On the ventral forewing the pale subapical marking and postdiscal spot in cell Cu₂ have the distal edge dark orange. Both the nominate subspecies and A. r. myriea have the white spots of the ventral submarginal series greatly elongated and almost fused with each other. A. paraena paraena is very similar but the ventral submarginal series are composed of single dashes instead of paired spots.

Discussion.—Only a single specimen is known of A. radiata explicator and so it is not possible to assess variation. We deliberated for some time as to whether or not to describe this subspecies; although it is instantly recognizable from A. radiata gillettia by the lack of an orange spot on the dorsal forewing in cell Cu₂, in other species, such as A. serpa, the amount of orange on the forewing can be slightly variable, extending into cell Cu₂ in most Guianan specimens but not, or only very rarely, in Amazonian individuals. Thus Hall (1938) described specimens with orange in cell Cu₂ as A. serpa timmehri, while Brévignon (1995) described those without as A. celerio florea. We regard both these names as synonyms of A. serpa diadocbus, described from Peru. However, since the difference in the amount of forewing orange between A. radiata gillettia and A. radiata explicator is much more pronounced than that between any Guianan and Amazonian A. serpa, and since there also exist other differences in the shape of the forewing subapical marking, the width of the white postdisclial band on the forewing and the color of the pale postdisclial spot on the ventral forewing in cell Cu₂, we believe A. radiata explicator merits specific recognition.

Adelpha radiata explicator is extremely rare, only a single specimen being known, although it must have a broader west Amazonian range, at least. The holotype male was captured in a large light gap created by a recent tree fall along a ridgeway in primary forest. This individual was flying about the clearing in bright sun in the middle of the morning, with the characteristic flight of all serpa-group members, periods of alternating rapid wing beats and gliding. It perched in between flights on bushes 1-5m above the ground around the edge of the arena, in the company of A. paraena paraena. The behavior of this subspecies (and A. radiata aiicella described below) is similar to that observed in A. radiata gillettia as reported by Brévignon (1995), who states that gillettia occurs in openings on hilltops in the late morning. In fact, it seems that all known male specimens of A. radiata outside of southeastern Brazil have been captured on hilltops, and no doubt further collecting in this microhabitat will extend the known ranges of A. radiata subspecies and possibly reveal further undescribed taxa.
Fig. 12-20. Male and female genitalia. For Fig. 12-17: a) male, lateral view; b) male, inside lateral view of left valve showing clunicula; c) female, dorsal view; d) female, lateral view. For Fig. 18-20: male genitalia, lateral view. 12. Adelpha hesterbergi n. sp. holotype. 13. A. sicaeus (Butler, 1866), E. Ecuador. 14. A. lamañi n. sp. holotype: a,b; paratype: c,d. 15. A. attica hemileuca n. ssp. paratype, W. Ecuador. 16. A. iphicles estrecha n. ssp. paratype. 17. A. iphicleola thessalita n. ssp. holotype. 18. A. hys hewittoni n. ssp. holotype. 19. A. radiata explicator n. ssp. holotype. 20. A. radiata aeiellae n. ssp. holotype.
Adelpha radiata atelae Willmott & Hall, new ssp.

Description.—MALE: Forewing length 30.5 mm; wing shape similar to A. radiata explicator. Differs from A. radiata explicator n. ssp. as follows: Forewing: reddish scaling in discal cell fills area between first and second cell bars, a pale grayish "hourglass"-shaped marking in discal cell distal to second cell bar; postdiscal white blocks along anal margin and in cell 1A+2A narrower, white marking in cell CuU more angular and bordering vein CuU; orange subapical marking paler, wider, outer edge inclined less sharply to costa, basal edge more perpendicular, veins crossing marking only faintly marked with darker scales; orange postdiscal marking in cell CuU smaller and poorly defined; anterior half cell CuU entirely dark brown. Hindwing: white postdiscal band narrower, more even, ending more sharply at vein 1A+2A; orange spot at tornus larger; outer postdiscal series visible as an indistinct, paler brown line. Ventral surface: Forewing: white postdiscal marking in cell 1A+2A extends more distally than on dorsal surface; whitish postdiscal spots (anterior postdiscal band) distal to discocellulars distinct and isolated from subapical marking; pale orange postdiscal spot in cell CuU, with an orange distal half; outer postdiscal series present as an ill-defined thick orange dash in cell CuU, sparse scales in cell 1A+2A. Hindwing: white postdiscal band differs as on dorsal surface; orange postdiscal band of outer postdiscal series broader, paler, and of even width; spots of inner submarginal series of constant width. Head, Thorax, Abdomen and Genitalia (Fig. 20) as in A. radiata explicator.

FEMALE: differs from male as follows: forewing length 34 mm; wings broader and more rounded. Wider and more rounded white postdiscal spot in cell CuU, and a tiny white spot near base of cell CuU, on forewing dorsal surface, and a little orange scaling on hindwing dorsal surface outer postdiscal series in cells M. Submarginal ventral surface markings of submarginal series slightly broader.

Types.—HOLOTYPE: ECUADOR. – Carchi Prov.: nr. Lita, Rio Baboso, ridge to east, 900 m, 11 Jul 1994 (J. P. W. Hall) (to be deposited in the BMNH).


Etymology.—This subspecies is named for Annette Aiello, who has contributed greatly to the understanding of species relationships within Adelpha through her studies of immature stages, and who has always been a source of much help and encouragement.

Diagnosis.—Adelpha radiata atelae n. ssp. differs from A. radiata explicator as detailed in the Description above. A. radiata gillettei has the orange subapical marking on the dorsal forewing continuing as orange postdiscal blocks into cell CuU, and the white postdiscal band reduced, particularly in cell CuU. The nominate subspecies and A. radiata myrtea differ from A. radiata atelae as they do from A. radiata explicator. All subspecies of the similar A. paraena have single instead of paired spots composing the submarginal series.

Discussion.—There is some variation in the size of the orange spot in cell CuU, on the dorsal forewing, but this is not geographically dependent. Panamanian specimens have the veins crossing the orange subapical marking on the dorsal forewing slightly less strongly lined with dark brown than the two known Ecuadorian specimens.

Adelpha radiata atelae is currently known from central Panama to northwestern Ecuador, from near sea-level to 900 m, and like all other subspecies of A. radiata it is very rare. The only known male was found perching on top of a 4 m high bush at the edge of a very wide path along the top of a steep-sided forested ridge. The single female we have seen was flying 5 m above a wide river through secondary growth in the early afternoon.

Constantino (1998) has recently reared this new subspecies in western Colombia on Cespededia spathulata (Ochnaceae), and described the last instar and pupa under the name A. paraena. Examination of the voucher specimen in the LMC confirms it to be this taxon. Aiello (1984: 28) also reports rearing a species in the serpa group (her Group I) with a larva resembling A. serpa celerio but a pupa resembling A. paraena. Unfortunately the pupa died, but this species might well have been A. radiata.

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