An illustrated and annotated checklist of the taxa of *Horaga* Moore, 1881, occurring in the Indonesian provinces of North Maluku and Maluku (Lepidoptera: Lycaenidae)

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Abstract: This paper recognises 4 taxa (2 species) of the lycaenid genus *Horaga* Moore, 1881 that occur in the Indonesian provinces of North Maluku and Maluku. The taxonomic status of *Myrina ciniata* Hewitson, 1863 is discussed and resolved. One new subspecies is described: *Horaga syrinx* ***tuscani*** **ssp. n.** (holotype male in BMNH) from Halmahera. One new island locality record is introduced, a map shows all the islands discussed in the text and all taxa are illustrated in colour.

Keywords: Lepidoptera, Lycaenidae, Theclinae, *Horaga*, *ciniata*, *tuscani*, new subspecies, new locality record, Indonesia, North Maluku, Maluku.

Illustriertes und kommentiertes systematisches Verzeichnis der Taxa der Gattung *Horaga* Moore, 1881 der indonesischen Provinzen Maluku und Nord-Maluku (Lepidoptera: Lycaenidae)

Zusammenfassung: In dieser Arbeit werden 4 Taxa (von 2 Species) der Lycaenidengattung *Horaga* Moore, 1881 von den indonesischen Provinzen Maluku und Nord-Maluku gemeldet. Der taxonomische Status von *Myrina ciniata* Hewitson, 1863 wird diskutiert und geklärt. Eine neue Unterart, *Horaga syrinx* ***tuscani*** **ssp. n.,** wird beschrieben (Holotypus Männchen in BMNH). Ein neuer Inselnachweis wird gegeben, eine Karte zeigt alle im Text diskutierten Inseln, und alle Taxa werden farbig abgebildet.

Introduction

This is the 3rd in a series of similarly formatted papers on the lycaenid genera of the Indonesian provinces of North Maluku (Maluku Utara) and Maluku, published in NEVA. Here we provide an illustrated and annotated short checklist of the species and subspecies of the genus *Horaga* Moore, 1881 (Lycaenidae, Theclinae, Horagini) known to occur there, together with their known ranges. One new subspecies is described and one new locality record is introduced.

We now recognise four taxa comprising two *Horaga* species, as occurring in the Maluku area. There has been considerable confusion over the identity of the taxon *ciniata* Hewitson, 1863, which we resolve here. A map shows the main islands of Maluku and North Maluku and both surfaces of both sexes of each Maluku taxon are illustrated. We have examined the collections of the Natural History Museum, London (BMNH), and also some private collections.

Biogeography and definitions of North Maluku and Maluku

This has been discussed in depth in the first paper in this series on the genus *Jamides* of Maluku and North Maluku by Rawlins et al. (2014).

Here we make the following key points:

- We use the term Maluku to include both the Indonesian political Provinces of North Maluku (= Maluku Utara) and Maluku.
- We also use the geographical terms "northern Maluku" and "central Maluku".
- "Northern Maluku" includes the islands of Morotai, Halmahera, Ternate, Bacan, Kasiruta and Mandioli.
- "Central Maluku" includes the islands of Buru, Ambelau, Manipa, Kelang, Buano, Seram, Ambon, Haruku, Saparua, Nusa Laut, Geser and Seram Laut.

Horaga taxa have been recorded from northern Maluku and central Maluku as well as one record by Parsons (1998: 399) of *H. syrinx* from Goram (= Gorong). Gorong is within the political Province of Maluku but outside our definition of the geographical entity "central Maluku", lying to the south-east of Seram just beyond Seram Laut; see map.

As noted in the previous two papers in this series, Rawlins et al. (2014: 8) and Rawlins & Cassidy (2016: 145–146), Maluku is an area of generally high butterfly endemicity and this is supported here. Of the two *Horaga* species occurring In Maluku, one — *H. ciniata* — is endemic to northern Maluku. The other species — *H. syrinx* — ranges across Asia but the three subspecies represented in Maluku are all endemic.

We use the term "New Guinea" in its geographical sense to mean the whole island including both the Indonesian western half of the island, as well as the eastern half belonging to the country of Papua New Guinea.

Abbreviations used

BMNH	The Natural History Museum, London, UK.		
CARR	coll. Andrew Rawlins, Rainham, Kent, UK.		
FwL	forewing length.	HT	holotype.
LT	lectotype.	PT	paratype.
ssp.	subspecies	ssp. n.	subspecies nova
stat. n.	status novus	TL	type locality
uns	underside	UpF	Upperside forewing
ups	upperside.		

Annotated checklist of the *Horaga* taxa of North Maluku and Maluku

Horaga Moore (1881: 98). — Type species: (*Thecla*) *onyx:* Moore ([1858]: 30), by original designation.

The key work on the genus is the review of the "Indo-Oriental Horagini" by Cowan (1966). Other significant works include Eliot (1986) on the complex of *Horaga*

albimacula, Seki et al. (1991) on the Bornean taxa and Yago (2004) which includes a key to all the *Horaga* species.

Cowan (1966: 109) preserved *Rathinda* Moore, 1881 as a distinct genus on the basis of clear differences in wing pattern and male genitalia, while noting the similarity of wing venation and shape.

Eliot (1973: 434-435) considered the tribe Horagini Swinhoe, 1910 to comprise just two genera — *Horaga* and *Rathinda*. He noted (p. 462) that the monobasic *Rathinda* (*R. amor* Fabricius, 1775) was only doubtfully distinct from *Horaga*.

The genus is widespread in the Indo-Australian Region from India and Sri Lanka to Taiwan and through Indonesia and the Philippines to New Guinea.

Cowan (1966) recorded seven species of *Horaga* and over 40 subspecies. Since then four new species have been described and some subspecies have been treated as full species by Hayashi (1984), Eliot (1986) and others. Yago (2004) considered *Horaga* to contain 14 species.

In Maluku we record two species comprising four taxa including one new subspecies here described.

Horaga syrinx (C. Felder, 1860)

Myrina syrinx: C. Felder (1860: 452); TL: Ambon.

Range: India, Bhutan, Myanmar, Thailand, Malay Peninsula, Singapore, Indonesia, Borneo, Palawan, Philippines, New Guinea. Within Indonesia known from Nias, Banka, Sumatra, Kalimantan, Java, Bali, Lombok, Sulawesi, Maluku, Mefor, Ron, Biak, Irian Jaya (Indonesian New Guinea) (BMNH, Cowan 1966) and new records from Pagai and Belitung.

Note: Cowan (1966: 119–126) recorded 14 subspecies. Two further subspecies from the Philippines have been described since then: *ashinica* Murayama & Okamura, 1973 and *incerta* Schroeder & Treadaway, 2001. One (*decolor*) is now considered to be a subspecies of *onyx* Moore, 1858 (Treadaway & Schroeder 2012: 39).

Two subspecies are currently known to occur in Maluku and we add a third here.

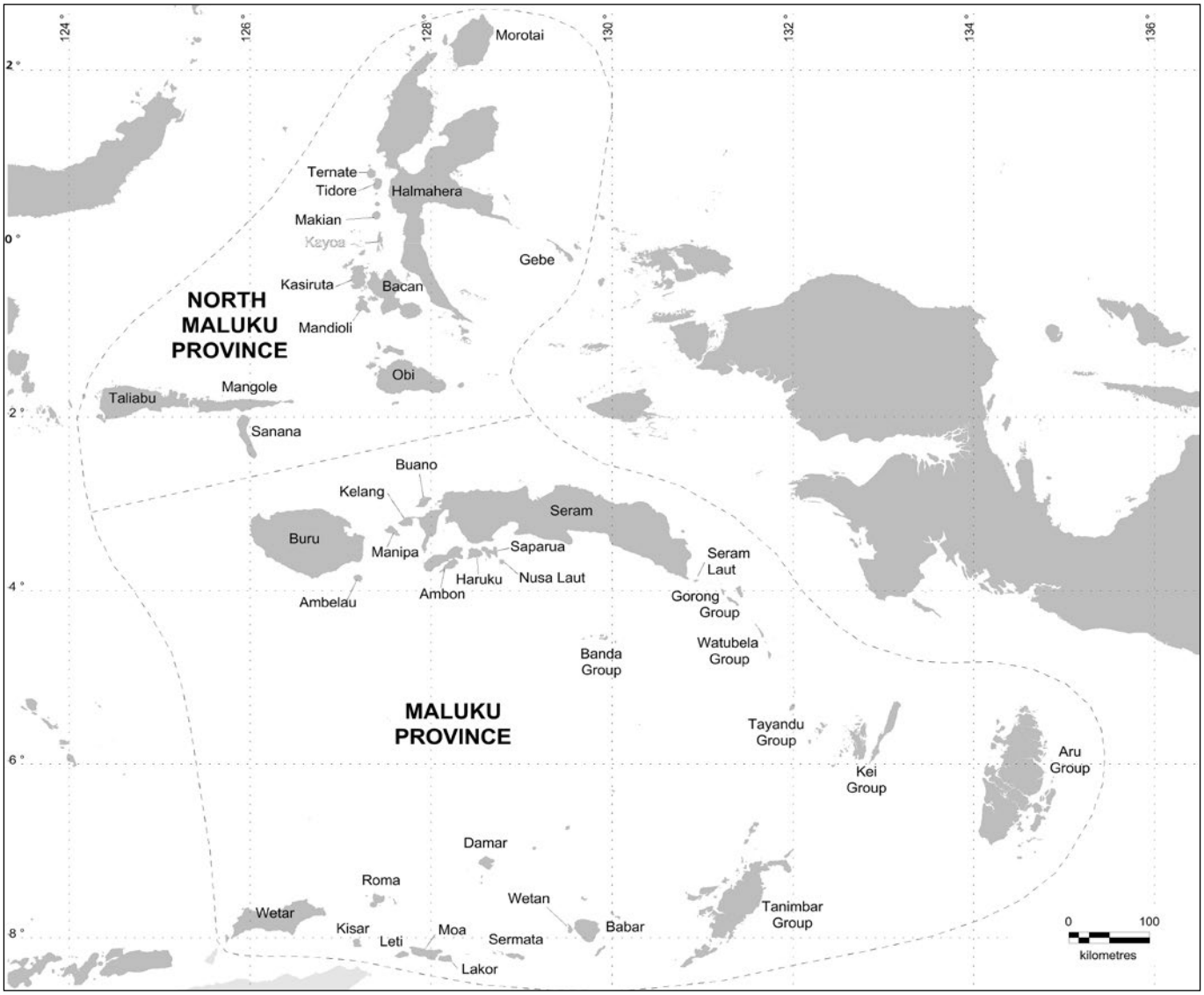
Horaga syrinx syrinx (C. Felder, 1860)

(Figs. 1–2: ♂, Ambon; Fig. 36: its genitalia; Figs. 3–4: ♀, Ambon; Figs. 5–6: ♂, Seram; Figs. 7–8: ♀, Seram; Figs. 9–10: HT ♀, Ambon.)

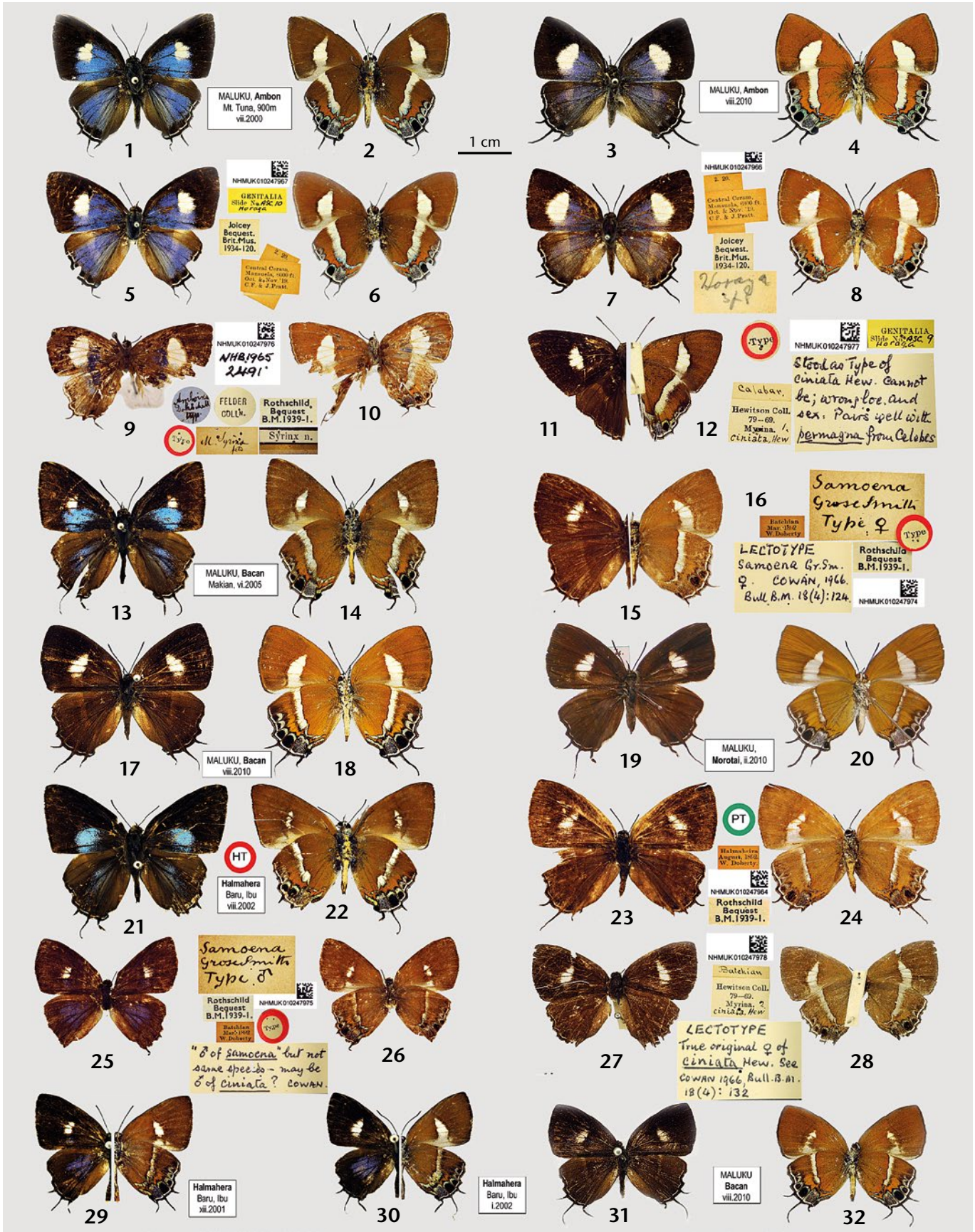
Myrina syrinx: C. Felder (1860: 452); TL: Ambon; see note 1.

Range: Seram, Ambon (BMNH, Cowan 1966). Parsons (1998: 399) also recorded Goram (= Gorong).

Note 1: Felder (1860) described the female in Latin and noted the specimen to be in his collection. This HT ♀ from Ambon is in the BMNH Type Collection.



Map: Provinces of North Maluku and Maluku — island names used in the text.



Figs. 1–24: Subspecies of *Horaga syrinx*. — **Figs. 1–10:** *Horaga syrinx syrinx*. **1–2:** ♂, ups./uns., Ambon (Mt Tuna, 900 m, VII. 2000, CARR). **3–4:** ♀, ups./uns., Ambon (VIII. 2010, CARR). **5–6:** ♂, ups./uns., Seram (Manusela, 6000 ft., X. & XI. [19]19, PRATT & PRATT, BMNH). **7–8:** ♀, ups./uns., Seram (Manusela, 6000 ft., X. & XI. [19]19, PRATT & PRATT, BMNH). **9–10:** ♀, HT, ups./uns., Ambon (Amboina, FELDER Colln., BMNH). — **Figs. 11–12:** *H. syrinx permagna*. ♂, ups./uns., Sulawesi ("*ciniata*" HEWITSON Coll., Calabar, BMNH). — **Figs. 13–18:** *H. syrinx samoena*. **13–14:** ♂, ups./uns., Bacan (Makian, VI. 2005, CARR). **15–16:** ♀, LT, ups./uns., Bacan (Batchian, III. 1892, DOHERTY, BMNH). **17–18:** ♀, ups./uns., Bacan (VIII. 2010, CARR). — **Figs. 19–20:** *H. syrinx tuscani*? ♀, ups./uns., Morotai (II. 2010, CARR). — **Figs. 21–24:** *H. syrinx tuscani* ssp. n. **21–22:** ♂, HT, ups./uns., Halmahera (Baru, Ibu, VIII. 2002, BMNH). **23–24:** ♀, PT, ups./uns., Halmahera (Halmaheira, VIII. 1892, W. DOHERTY, BMNH). — **Figs: 25–32:** *H. ciniata*. **25–26:** ♂, ups./uns., Bacan ("*samoena*" GS, Batchian, III. 1892, W. DOHERTY, BMNH). **27–28:** ♀, LT, ups./uns., Bacan (Batchian, HEWITSON Coll., BMNH). **29:** ♂, ups./uns., Halmahera (Baru, Ibu, XII. 2001, CARR). **30:** ♂, ups./uns., Halmahera (Baru, Ibu, I. 2002, CARR). **31–32:** ♀, ups./uns., Bacan (VIII. 2010, CARR).

Fig. 33: *H. ciniata*, ♂, genitalia, Halmahera (Baru, Ibu, I. 2002, CARR). — **Fig. 36:** *H. syrinx syrinx*, ♂, genitalia, Ambon (Mt. Tuna, 900 m, VII. 2000, CARR). — **Fig. 37:** *H. syrinx samoena*, ♂, genitalia, Bacan, (Makian, VI. 2005, CARR). — **Fig. 38:** *H. syrinx tuscani* ssp. n., ♂, genitalia, Halmahera, (Baru, Ibu, VIII. 2002, BMNH).

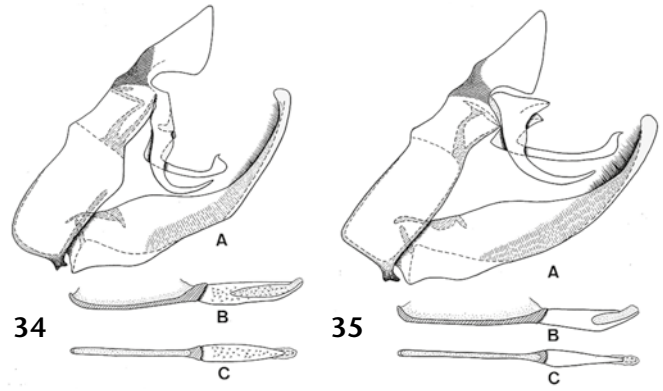


Fig. 34: *H. albimacula albistigmata*, ♂, genitalia, West Malaysia (from ELIOT 1986). — **Fig. 35:** *H. chalcedonyx malaya*, ♂, genitalia, Singapore (from ELIOT 1986).

Note 2: COWAN (1966: 125) wrote: "FELDER's type specimen, so marked ex coll. ROTHSCHILD, survives in very battered condition with three wings parts of which are transparent, but traces of the blue colour are left." COWAN further noted that the abdomen attached to this female type looked strange and on dissection, proved to be that of a totally unrelated male! We illustrate this specimen (Figs. 9–10). COWAN also described a male from Seram at the BMNH (Figs. 5–6).

Horaga syrinx samoena GROSE SMITH, 1895

(Figs. 13–14: ♂, Bacan; Fig. 37: its genitalia; Figs. 15–16: LT ♀, Bacan; Figs. 17–18: ♀, Bacan.)

Horaga samoena: GROSE SMITH (1895: 513); TL: Bacan; see notes 1 & 2.

Range: endemic to Bacan (BMNH, COWAN 1966); see note 2.

Note 1: GROSE SMITH (1895) described *samoena* as a full species from 1 ♂ and 3 ♀♀ and recorded the habitat as Bacan. He didn't specify a holotype.

Note 2: COWAN (1966: 124–125) noted one WATERSTRADT and two DOHERTY ♀♀ from Bacan. He designated one of these DOHERTY Bacan ♀♀ as the LT (Figs. 15–16). In addition he noted one DOHERTY ♀ from Halmahera. He did not comment on this specimen and we consider it to belong to a distinct taxon as discussed below.

Note 3: COWAN (1966: 124) considered the only male in the type series to represent an altogether different species. See discussion under *Horaga ciniata* HEWITSON, 1863.

Note 4: We have examined 1 ♂ from Bacan (Figs. 13–14) that is compatible with the *samoena* ♀ LT. We have dissected and studied the genitalia (Fig. 37) of this ♂ and compared it to COWAN's genitalia drawings (1966: pl. 2, fig. 19) and key (p. 113) and confirm it is conspecific with *syrinx*.

We have also examined 3 ♂♂ from Halmahera. The Halmahera ♂♂ lack the UpF white oval mark present in the Bacan male. We conclude the population from Halmahera represents a new race described here.

Horaga syrinx tuscani ssp. n.

(Figs. 21–22: HT ♂, Halmahera; Fig. 38: its genitalia; Figs. 23–24: PT ♀, Halmahera.)

Holotype ♂: Indonesia, Halmahera, Ibu, Baru, viii. 2002 (BMNH).

Paratypes (2 ♂♂, 2 ♀♀): Halmahera, Ibu, Baru: 1 ♂, XII. 2001; 1 ♂, I. 2002; 1 ♀, VIII. 2002 (CARR). Halmahera: 1 ♀, VIII. 1892, W. DOHERTY (BMNH).

Etymology: named for the nickname of the first author's son.

Range: Halmahera, Morotai; see note 1.

Note 1: We show in Figs. 19–20 the first record of *Horaga* from Morotai — a female in the collection of Akira YAGISHITA. This specimen is similar to *syrinx* females from Bacan and Halmahera but smaller (FwL = 16.5 mm) than both. It differs from *ciniata* females which are even smaller and have a more rounded apex of the forewing. This may represent a further new race of *H. syrinx*, but in the absence of further material, especially males, we place it here for now. It is not included as a paratype.

Note 2: We have dissected the *tuscani* HT ♂ and consider its genitalia (Fig. 38) show it to be conspecific with nominotypical *syrinx* and *samoena*, therefore *tuscani* is placed as a new race of *H. syrinx*. It is closest, both geographically and phenotypically, to *samoena*. Males of *tuscani* clearly differ on the upperside from those of *samoena*, but the females are indistinguishable. The upperside forewing white discal markings in the females from both Bacan and Halmahera are somewhat variable in size and the underside white median band is variable in both sexes.

Diagnosis and description

♂: Figs. 21–22, 38. FwL 18 mm. Upperside similar to *samoena* (Fig. 13) except lacking the UpF white discal patch always present in *samoena* and also *syrinx* (Fig. 1). Underside similar to *samoena* (Fig. 14) with the white median band on both wings variable in width.

The ♂ **genitalia** (Fig. 38) conform with those of *syrinx* (Fig. 36), the valva strongly curved and tapering to a blunt apex. However, the valva in *tuscani* a little shorter and more stout than the other subspecies. We do not consider these small differences to be of specific significance and retain the taxon within the species *syrinx.*

♀: Figs. 23–24. FwL 18 mm. Upperside indistinguishable from *samoena*. UpF small white discal patch slightly variable and similar to that in *samoena* (Fig. 15). Underside similar to *samoena* (Fig. 15) with the white median band on both wings variable in width in both taxa.

Horaga ciniata (Hewitson, [1863]), stat. n.

(Figs. 25–26: ♂, GS '*samoena*' Type, Bacan; Figs. 27–28: LT ♀, Bacan; Fig. 29: ♂, Halmahera; Fig. 30: ♂, Halmahera; Fig. 33: its genitalia; Figs. 31–32: ♀, Bacan.)

> *Myrina ciniata:* Hewitson (1863: 35, pl. XIV, figs. 30–31); TL: Bacan; but see notes 1–3.

Range: endemic to northern Maluku — Bacan (BMNH) and we add a new island record from Halmahera (1 ♂, I. 2002; 1 ♂, XII. 2001); see notes 1–4.

Note 1: Hewitson (1863) noted specimens varied in size from 0.9 to 1.3 inches (Cowan noted "equivalent by his method to fore wing lengths 11.5 to 16.5 mm") thus indicating more than one. He did not specify which sex he was describing but the two figures clearly show a female which matches his written description. He stated the specimens were "in the Collections of A. R. Wallace and W. C. Hewitson, from Batchian and India."

Subsequently Hewitson (1869: supplement p. 6) said that his original figure (pl. XIV, figs. 30–31) was from a female.

Note 2: Cowan (1966: 132) stated: "There has been unfortunate confusion and uncertainty over the identity and application of the name *ciniata* which even now cannot be fully resolved for lack of material."

He was confident that he had located Hewitson's illustrated female specimen in the main collection of the BMNH "with Hewitson's labels reading 'Batchian' and, glued underneath, two scraps '*ciniata*' and 'Ba...'." Cowan (1966: 133) recorded its FwL as 15 mm and designated this female (Figs. 27–28) as the lectotype of *ciniata*.

Note 3: The TL originally given by Hewitson as "Bacan and India" seems unlikely. Further confusion was added by Moore (1881: 99) who mistakenly used the name *Horaga ciniata* in his book "The Lepidoptera of Ceylon" but his description and illustrations clearly differed from true *ciniata*.

Later, Moore (1884: 525) corrected this error and formally described the taxon from Ceylon (Sri Lanka) that he had previously listed and illustrated as *ciniata* in his 1881 book. He named this taxon *Horaga cingalensis* Moore, 1884 (treated by Cowan 1966 and subsequent authors as *Horaga onyx cingalensis*). He noted that the new taxon was quite distinct from *ciniata* and stated that *ciniata* was confined to Bacan. De Nicéville (1890: 417) correctly followed this.

Subsequent to de Nicéville (1890) a number of authors including Fruhstorfer (1897: 115), Swinhoe (1912: 12), Fruhstorfer (1912: 233), Seitz (1927: 982, pl. 158, figs. a1–a2) and Corbet (1941: 50) mistakenly gave the locality for *ciniata* as Sulawesi. This presumably originally resulted from Hewitson's 1869 '*ciniata*' male 'type'. See below.

Note 4: We are confident that true '*ciniata*' is restricted to northern Maluku – Bacan and Halmahera (new record). We consider it likely that the taxon, or an undescribed *ciniata* subspecies, is also present on Morotai.

Note 5: Relating to the identity of the male of *ciniata:*

a) Hewitson (1869: supplement p. 6) in addition to noting that his illustration of *ciniata* in 1863 was from a female (see above), also said that he had since received the male, noting that it did not differ from the female "except in its greater size and in the more acute apex of the anterior wing." Hewitson gave no locality for the male.

b) Cowan (1966: 133) was confident he had located this male in the Type Collection at the BMNH denoted as the type specimen of "*ciniata* Hew". He stated that it contained Hewitson labels reading "Calabar" and on a scrap of paper glued below "Celeb." Cowan added: "It is clear that it is not conspecific with the much smaller ♀♀ which Hewitson originally had named *ciniata*." Cowan was confident it came from "Celebes" (Sulawesi) and noted that this male had never been described or illustrated and therefore could not be a type specimen. He considered it to be *H. syrinx permagna* Fruhstorfer, 1912. This taxon is endemic to Sulawesi. We have examined this specimen (Figs. 11–12) from the Type Collection at the BMNH and agree.

c) This meant that the male of *ciniata* was at that stage unknown.

d) Cowan (1966: 124 & 133) considered the male in Grose Smith's (1895) type series of *samoena* was not conspecific with the females. He noted it had no abdomen, palpi or forelegs. He stated that it had no sexual insignia and therefore must be either a subspecies of *albimacula* (he considered *chalcedonyx* Fruhstorfer, 1914 to be a race of *albimacula*) or *amethystus* or a new species. He further added: "Its 14 mm. fore wing matches well the 15 mm. of Hewitson's ♀ *ciniata*, and they may well be conspecific". He concluded: "More cannot be decided until fresh material of both sexes of all species is available from Batchian."

e) We now have the benefit of further material. We have one *Horaga* Bacan ♂ (Figs. 13–14 and genitalia Fig. 37) that genital dissection confirms is conspecific with *syrinx* but is clearly phenotypically distinct from nominate *syrinx*. This ♂ appears compatible with the *samoena* ♀ LT (Figs. 15–16) and we consider it to be the male of *H. syrinx samoena* (see *H. syrinx samoena* section).

It *is* clearly very different from Grose Smith's '*samoena*' ♂ type (Figs. 25–26), thus confirming Cowan's assertion that Grose Smith's '*samoena*' ♂ type was not conspecific with Grose Smith's *samoena* ♀ type which Cowan (1966: 124) designated as the LT.

Grose Smith's '*samoena*' ♂ type (Figs. 25–26) clearly matches two more recent Halmahera ♂♂ (Figs. 29 & 30). We consider these three ♂♂ are compatible with the *ciniata* LT ♀ (Figs. 27–28), as well as a further Bacan ♀ (Figs. 31–32). We are confident that these five specimens represent both sexes of *ciniata*.

We note that there are small individual differences in the size of the upperside white discal patch in both sexes, along with variability on the underside of the white median band. We also note that the females of *ciniata* are superficially very similar to those of *samoena* and *tuscani* but can be most easily separated by the considerably smaller size and more rounded apex of the forewing in *ciniata*.

Note 6: Relating to the status of *ciniata:*

As mentioned above, Cowan (1966: 128) treated *chalcedonyx* Fruhstorfer, 1914 as a race of *albimacula* Wood-Mason & de Nicéville, 1881. Eliot (1986) considered these two taxa to be closely-related but distinct species, separating them by "small but constant differences in the male genitalia". He listed a total of eight subspecies for *albimacula* and four for *chalcedonyx* and he named this group "The *Horaga albimacula* complex". The taxon *ciniata* was not mentioned.

We have dissected one of the Halmahera *ciniata* males (Fig. 30)

and compared its genitalia (Fig. 33) to the genitalia drawings and key of Cowan (1966) as well as with Eliot's (1986: 108–109, figs. 1–2) large, detailed drawings of the male genitalia of *albimacula* and *chalcedonyx* (Figs. 34–35 — shown by kind permission of Dr. Yositaka Sakamaki of the Entomological Society of Japan).

Like the taxa of the *Horaga albimacula* complex, *ciniata* has large genitalia. These are broadly similar to both *albimacula* and *chalcedonyx*, but have minor, clear differences from both species. We describe these here.

The uncus lobes of *ciniata* are closer to the triangular shape of *chalcedonyx,* while the dorsal side of the vinculum is straighter and its base more rounded than either of the other two species. The base of the brachia is also triangular and appears midway between the flat shape of the equivalent part in *albimacula* and the greatly produced apex in *chalcedonyx*. The right brachium is broadened and produced to a point at its tip, as in the other two species, but the arm itself is shorter and much more curved. The valva in *ciniata* is hirsute along its whole length and its general appearance with regard to width and taper appears to be intermediate between the other two species. However, the tip of the valva is broader and flatter, and apically more pointed than both the other species. In *ciniata*, as in *albimacula*, the vesica of the phallus is studded with minute teeth.

We conclude that *ciniata* Hewitson, 1863, is a distinct species but include it as a third species within the *Horaga albimacula* complex.

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