The Status of the Genus Saletara Distant (Lepidoptera, Rhopalocera) and its Species

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Saletara and Appias

Saletara was separated out of the comprehensive genus *Appias* by Distant in 1885 (in his work *Rhopalocera Malayana*) primarily on the grounds that the ♀ lacked vein 9 ('the fourth subcostal nervule') on the forewing. His type species was *nathalia* C. & R. Felder, from Luzon. He regarded *nathalia* as occurring in Nias, Sumatra, Java, Malaya, Borneo and Celebes, as well as the type locality, and as distinct from *panda* Godart (type from Java), which he recorded from Malaya, Sumatra and Java. He differentiated *panda* as lacking vein 9 in the ♂ as well as the ♀ and also by its 'more sulphureous colouration'.

In fact *nathalia* and *panda* are the respective races, from their type localities, of the same species. The latter is generally more sulphureous than all the other races from the areas named, but these vary considerably in their ground colour. Moreover, in both sexes of both races, vein 9 of the forewing may be present or absent, though always less in evidence in the ♀. In specimens in the British Museum, ♂ ♂ from the Philippines nearly always lack vein 9, which is present as often as not elsewhere; it is often only minute, but may be up to 2½ mm. long throughout its territory. In both sexes cases occur where it is present on one forewing and not on the other, reflecting the inconstancy of the character. Distant's figure of the ♀ *nathalia* clearly shows vein 9 present—contrary to his definition of the genus.

Saletara ♂ always carries three tufts distal on the abdomen—two ventral and one dorsal. These lie flat, parallel with the valvae. They are normally used as a further distinction from *Appias*, which is said to lack the third, dorsal, one.

In fact, *Appias*, in some species (e.g. *lalassis*) has no tufts at all, while in others (e.g. *paulina*, *albina*, and the blue *A. mata caeca* from Sipora) all three may be present. In general, *Appias* has shorter and denser tufts than *Saletara*, and the valvae are usually broad and blunt whereas *Saletara* valvae are long and sharp-ended.

The late Dr. A. S. Corbet, in the manuscript of his 2nd edition of Butterflies of the Malay Peninsula, now in the press, states that tufts may be present in the *Appias* ♀. I have found no examples of this. On the other hand, no reference can be found to the existence of tufts in the *Saletara* ♀, except that Bingham says 'of course they are absent'.

In fact, every ♀ I have examined in this genus carries a tuft in a longitudinal downy pouch distal under the abdomen. Normally, in set specimens, this pouch is closed and inconspicuous, but traceable with the naked eye at a glance once recognised. Occasionally, in set specimens (as in the type specimen of *hostilia* Fruh.) the pouch slit is ajar and the tuft protrudes, or (as in the type of *martia* Fruh.) the pouch may be agape and empty, but still evident. No specimens of any ♀ *Appias* have been found with such a tuft, nor *Saletara* without, in an examination covering specimens from India to the Solomon Islands.

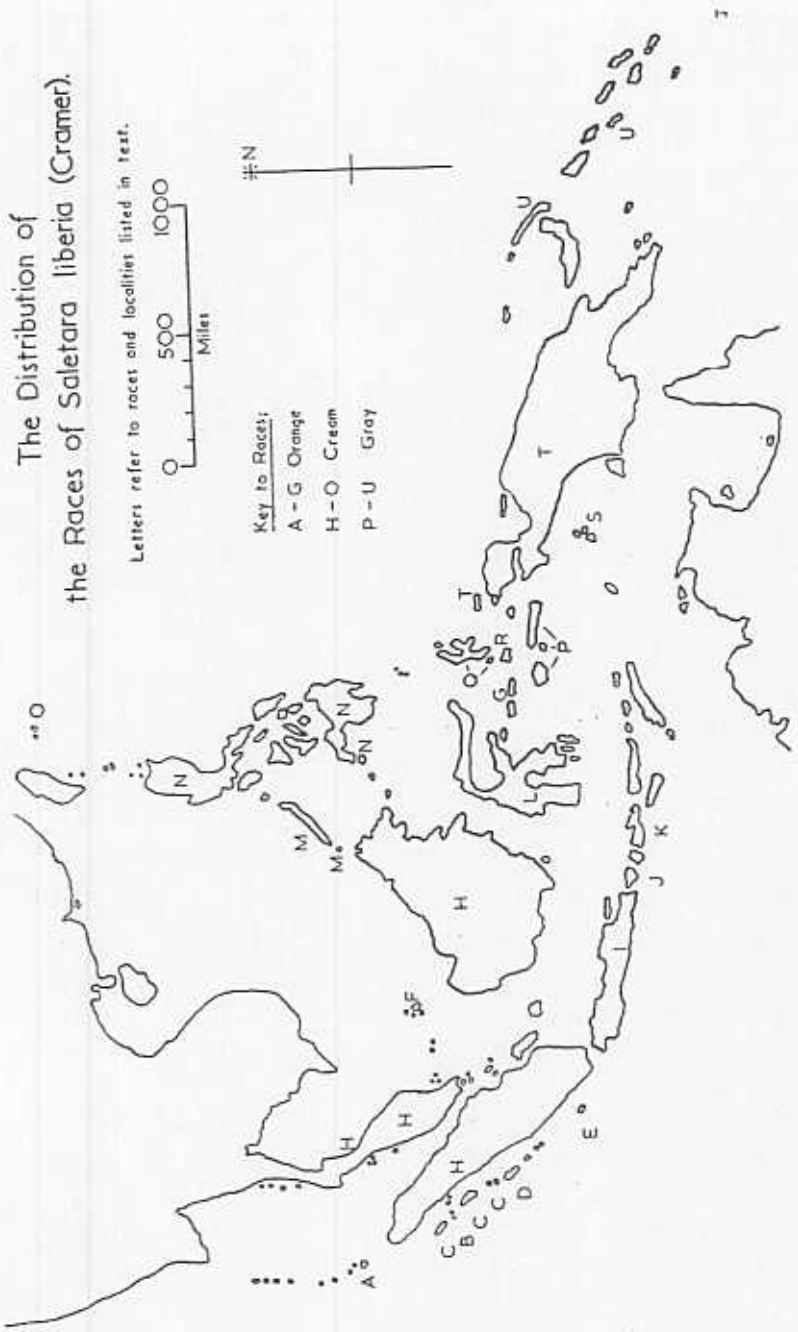
It is considered that, though a revision of the whole *Appias* complex may be required, *Saletara* must remain separate despite its anomalous foundation. Its key characteristics are the obsolescent state of vein 9 of the forewing in both sexes, the different ♂ genitalia, and the enclosed abdominal tuft of the ♀. Several authors have remarked on the difficulty of defining the genus, but simultaneously have agreed that it is a natural entity.

Saletara is confined to the Indo-Australian Region between the South Nicobars and Peninsular Siam in the north-west, the Philippines in the north-east, and New Guinea and the Solomons in the south.

Saletara species

Hitherto four species have been accepted; *panda* Godt., cream to orange, whose range to the Philippines and Celebes has already been outlined, and *liberia* Cr., *cycinna* Hew., and *gisco* Gr. Sm., which are blue-gray above and all entirely lack vein 9. *Liberia* inhabits the Moluccas and *cycinna* thence continues to the East giving way to *gisco* in the Solomons. It may be noticed at once that these nowhere overlap.

Corbet (loc. cit.) treats these as all races of the one species. It was in probing for the reason for this treatment that the material for this article was assembled. His genitalia slide preparations of a ♂ *liberia* from Ceram and a ♂ *panda* from Java have been found, and no significant difference can be detected. This by itself would in no way be conclusive, but viewing all the available material, it is considered that *Saletara* must be regarded as so far monospecific in *liberia*—an extremely interesting species, crossing Wallace's Line unperturbed but showing strong reactions on reaching Weber's Line.


The Distribution of
the Races of Saletara liberia (Cramer).
Letters refer to races and localities listed in text.
0
500
1000
Miles
N
Key to Races:
A - G Orange
H - O Cream
P - U Gray

Saletara liberia races

The nomenclature has been much complicated; partly because of the paucity of the original material, coupled with the variation of the *panda* races in colour and venation; and partly because of the sexual dimorphism, coupled with the fact that several authors mixed their sexes or localities.

In amplification of the survey of forms given earlier, the races in succession from West to East show, first, a gradual darkening of the ground colour till the Philippines are reached, and the gradual disappearance of forewing vein 9. The normal colour variation in each race is appreciable and intermediates occur; often the hindwing is yellower than the forewing. Additionally, to the West, from the Nicobars to Enggano through the Mentawei Islands, and also in the Natunas, the ground colour is bright creamy orange. This form recurs, most surprisingly, in the Sula Islands, the eastern extreme of *panda* territory and right in the middle of the transitional area.

Then "Wallacea" brings the transition from the *panda* races to the blue-gray ones, in which vein 9 is obsolete in both sexes. The small Molucca group of islands produces *liberia* forms with both ♂ and ♀ gray, though white varieties of the ♀ occur. The underside of *liberia* contrasts markedly as more than one author has noted—the forewing being greenish and the hindwing clear bright orange—while further north *eliada* is uniform mustard below.

The New Guinea area gives rise to the *cycinna* races, with *gisco* in the Solomons. In these the ♀ reverts to white or yellow above with broad black distal borders and is dimorphic with, apparently, no intermediates.

Nomenclature

The chronological sequence of publication of the original 33, and 2 new, names for the species follows, with references to the specimens in the British Museum main and type collections in London and the Tring collection.

1779 *liberia* (Cramer) ♂ Amboina. Pap. Exot. III p. 31 & Plate 210 figs. G. and H.
The figure shows vein 9 present—an error?

1819 *panda* (Godart) ♂ Java. Enc. Meth. IX p. 147 No. 102. Figured.
That this rather exceptional race *panda* was described so early, and that the ♂ closely resembles variants from elsewhere, caused some subsequent confusion. Java is noted for the

individualism of its races, and this one is noticeably different from its neighbour *distanti* which covers the whole of Neomalaya.

1861 *cycinna* (Hewitson) ♂ "New Guinea", recte Aru Is. Exot. Butt. II Plate 4 figs. 23 and 26.
Comparison of the Type with series from both localities confirms that Aru is the correct locality of this and the next, as agreed by most authors but not followed by Fruhstorfer in Seitz (see below, 1910).
The race is spelt *concinna* in the text but corrected to *cycinna* in the Introduction.

ocina (Hewitson) ♀ Loc. and ref. as for *cycinna;* figs. 24, 25. A white ♀.

eliada (Hewitson) ♂ Batchian. Ref. as for *cycinna;* figs. 27, 28.
Described as "probably the ♂ of Cramer's *P. liberia* ♀", and so confirmed in the Introduction. No description by Cramer of a ♀ *liberia* can be found.

1862 *nathalia* (C. & R. Felder) ♂ Luzon. Wien. Ent. Mon. VI p. 285.
As "*P. nathalia* Boisd. in litt."

1865 *sulphurea* (Vollenhoeven) ♀ Mentioning also Malaya, and var. *pandae* (sic) Godt. "trois individus que je crois être des femelles" which had been taken on Prof. Reinwardt's voyage to the Moluccas. Description and figure do not agree with Molucca specimens and must be considered referable to the Javan race, as yellow ♀ form of *panda*. Monogr. II (Pieridae) p. 32 and Plate 4 fig. 4.

1867 *panthea* (Wallace) ♀ Philippines. Trans. Ent. Soc. Lond. (3) IV p. 376.
The yellow ♀ form of *nathalia*.
In this article, starting on p. 361, Wallace raised the genus *Tachyris*, based on the strong anal tufts of the ♂. He separates the species into groups on the basis of colour, so that *panda* and *liberia* are in separate groups mixed with *Appias* species. Without explaining why, he places *panthea* with the gray ♂ ♂ of the *liberia*

group, far from *panda* and *nathalia*, but saying he expects the ♂ will be like *nathalia*. Correctly.

He correctly brackets *sulphurea* with *panda*. He correctly gives Aru as the locality of *cycinna* and describes the cream to yellow variation of its underside, which reflects the parallel variation in the *panda* group upperside.

corinna (Wallace) ♂, ♀ New Guinea (Waigeou). Same Reference, p. 377. ♂ resembling *liberia* but hindwing below with a broader black border; ♀ near *ocina* (*cycinna*).

Wallace now describes the ♀ of *liberia* and adds that this form is confined to Amboina whereas *eliada* covers Batchian, Obi and Ceram.

1886 *flavescens* (Ribbé) ♀ Aru Is. Iris I, p. 81.

The yellow ♀ form of *cycinna*.

1891 *nigerrima* (Holland) ♂ Celebes. Proc. Boston Soc. N. H. XXV p. 76 and figure.

The ♀ of the normal Celebes race, taken by Doherty in the southern peninsula.

1891 *schönbergi* Semper ♀ "Nias and Südost Borneo". Reisen Philipp. II (5) p. 249.

Described from a single ♂. The Nias race. The reference to S.E. Borneo is puzzling. This is an orange form; Borneo holds only the cream form, and is so contrived that it can hardly be said to have any S.E. territory. It might be a navigational misnomer for Sula (see the following), or a m.s. error for Siberut or Simalur.

The spelling of the name must now be *schoenbergi*. This is the first description under the Genus *Saletara*, and the first of an orange form. Semper here remarks on the anomalous foundation of Distant's genus, but deliberately accepts it.

In Tring Museum is a series from Nias with one ♂ very pale above, almost cream—like *distanti* from Sumatra, and a second intermediate between it and the normal Nias orange.

1894 *aurantiaca* Staudinger ♂ Mangoli (Sula Is.). Iris VII p. 352.
A striking orange race.
Of the 9 ♂ ♂ from 3 different collectors in the main B.M. collection, one has vein 9 long (2½ mm.), and in the other 8 it diminishes to minute, being absent from one wing completely in two specimens.

♀ At Tring are 3 specimens of the hitherto undescribed ♀. These are also arresting; darker even than the Celebes race. Above black, with only a small median pale area under 5 mm. wide on the forewing, from the base of vein 4 to the dorsum. Below dull orange, the whole outer half of each wing blackish brown.

(In 1894 Pryer and Cator published in the British North Borneo Herald their "Preliminary List of the Rhopalocera of North Borneo". They list both *nathalia* and *paulina* under *Saletara*, separately from *Appias*, in which genus the latter should really be placed).

1895 *gisco* (Grose Smith) ♀ New Georgia. Ann. Mag. N.H. (6) XV p. 229.
As *Appias gisco*. "♂", recte ♀.
This is the pale yellow ♀ form of the blue-gray ♂ from the Solomons. I can find no description of the latter. In the B.M. are the type specimen, a perfectly normal ♀ of the genus, and two fresh ♂ ♂. The ♂ is clear blue-gray above, the veins being faintly creamy, giving an overall impression of being lighter than *corinna*, with very narrow bordering. Below the colour is bright, the forewing more orange than usual, and the black borders much narrower.

A ♂ at Tring labelled New Ireland may herald a new race. This individual is intermediate between *gisco* and *corinna*. More specimens from these eastern outposts are needed.

Grose Smith's description of his cream ♀ from the Solomons as a ♂ has probably been a main contribution to the persistence of the treatment of *Saletara* as comprising more than one species.

1898 *distanti* Butler ♂, ♀ Malaya, Sumatra, Borneo. Ann. Mag. N.H. (7) II p. 400.

Separating the Neomalayan *distanti* and Javan *panda*. Butler is interesting if erratic on the genus as so far known. He is wrong on its erection, referring only to ♂ venation which, as he finds, is even less reliable than that of the ♀. Like Semper, he accepts the genus as a natural one, placing it between *Catophaga* and *Tachyris*. Though treating them as separate "species" in accordance with contemporary usage, he correctly brackets *cycinna* and *ocina; nathalia* and *panthea; panda* and *sulphurea*. He wants to link as seasonal forms *nigerrima* of Celebes, *schombergi* (sic) of Borneo (sic) and *aurantiaca* of Sula for a separate species, and he counts the cream "♂" *gisco* as another.

1900 *erebina* Fruhstorfer ♂, ♀ Palawan. Berl. Ent. Zeits. XLV p. 32.

As a race of *S. panda*, differing from *nathalia* (Luzon, Panaon, Mindanao, Bazilan), *panda* (Java), *distanti* Malaya, Sumatra, Borneo, Balabac), *schönbergi* (Nias), *nigerrima* (Tanetta, Samanga, Patunuang), and *aurantiaca* (Sula—Mangoli).

1903 *engania* Fruhstorfer ♂ Enggano Island. Soc. Ent. 18 p. 124; repeated Stett. Ent. Zeit. LXV p. 347.

Another orange race of *panda*, rather paler than all the others.

Br. Mus. has only the type specimen. The ♀ is not known.

chrysea Fruhstorfer ♂ Great Nicobar. Described with the last.

The north-westernmost race of the genus. Orange. B.M. has the type and 4 more ♂♂ from Great, and 3 from Little, Nicobar, and, in Coll Ferrar, 11 ♂♂ and 3 ♀♀ from the same places. The 3 ♀♀ are without vein 9, which is present or absent as usual in the ♂♂.

1906 *aurifolia* (Fruhstorfer) ♂ Siberut and Po. Tello. Ent. Zeitschr. Guben 20 p. 99.

As race of *Tachyris panda*.

The ♂ is figured in Seitz IX (1910) plate 62 fig. a, 3. There is a ♀ at Tring.

1908 *balina* ♂, ♀ Bali. Int. Ent. Zeitschr. Guben II p. 238.
Fruhstorfer As race of "*Salatura*" *panda*.
B.M. has only the ♀ type specimen, which is remarkably pale with rather pointed wings and quite narrow borders.

(1909 *kawakamii*) Kotosho I. (i.e. 50 miles East of South end of
(♂, ♀) Formosa and 120 miles North of Bataan). Ent.
(Matsumura) Zeitschr. Stutt. XXIII p. 88.
Described as an *Appias* species. Mentioned in Seitz Addenda as possibly a *Saletara*. Since declared by Sonan to be *Appias*.

1910— The following 10 new names were introduced by Fruhstorfer in 1910 in Seitz; Grosschmett. Erde, IX pp. 182—3, where he also gives a resumé of all the foregoing names except *panthea*. It may be noted that all Fruhstorfer's Type Specimens are held in the Br. Mus. except *erebina* ♂, *aurifolia*, *balina* ♂, *nivaria* ♀, *principalis* and *chrysoberylla*.

nivaria ♂, ♀ This name is given to the pale form of both sexes of all the *panda* group of races, as opposed to *sulphurea*, the other extreme, yellow, form.
This is the first traceable reference to this name, though Fruhstorfer does not indicate here that it is new. The same remark applies to the forms *principalis* and *vada* below.

martia ♂, ♀ Bazilan and Mindanao.
Differing from *nathalia* (Luzon) in having more extensive black markings.
I cannot support this distinction, finding Luzon and other Philippines specimens covering the same range in variation. The ♀ type specimen is practically identical above and below with a ♀ cotype of *panthea*.

hostilia ♀? Balabac.
The description refers to the ♀ facies, and the only representative in the B.M. is the ♀ type

specimen. This is so close to the ♀ type of *erebina* (both are yellow specimens), and to several others in the Palawan series, that I see no case for *hostilia* being a separate race as described. A synonym of *erebina*.

obina ♂, ♀ Obi Islands.

Both types are in the B.M. The ♂ has slightly broader borders than *eliada* and *liberia*—approaching in this respect and also in the regular inner edges to them, to *corinna*.

The ♀ varies here between two extremes; form *obina*, gray, much suffused, and broken up by black vein stripes between the broad dark basal and marginal areas (figured Plate 62 b.); and

pseudocorinna the other extreme, form *pseudocorinna*, whitish,
vada ♀ ♀ with narrower black borders like *corinna*. Inter-
principalis mediates run through ff. *vada* and *principalis*. (The former is close to the normal ♀ ♀ of *eliada* and *liberia*).

♀ form *obina* may be noted as the only form of either sex in the genus which carries any pale spotting either above or below. It has an interneural submarginal series of gray spots on the broad black border.

So, in the Moluccas area, are *eliada* in the North and *liberia* in the South, the former more uniform mustard below while the latter is contrasted green and orange. (Hewitson's mention of purple suffusion above in *eliada* is due to the type specimen being worn). Then, in between, in Obi, is *obina*, a race showing leanings and variation towards *corinna*.

chrysoberylla Buru I. (South Moluccas). ("common").

The description of this race, which can apply to either sex, gives the differences from *liberia* from the adjoining islands. They agree with those of *eliada* of North Moluccas and I regarded them as suspect until I saw the single ♂ specimen from Buru at Tring. This agrees perfectly with *liberia*, of which I consider *chrysoberylla* a synonym.

chryselectra ♂ Aru Is.
Fruhstorfer reverts to quoting Hewitson's description of *cycinna* as from New Guinea, whereas all others agree that the type locality was Aru, where the hindwing below varies from pale lemon to bright orange. The type specimen of *chryselectra* is rather small but otherwise no different from several other Aru ♂♂, and the name must fall as a synonym of *cycinna*.

hastia ♀ New Guinea.
A name for a normal specimen of the white ♀ form from New Guinea (= *ocina*). The yellow form *flavescens* seems to be the rarer. Another synonym of *cycinna*.

1913 *nargosa* Fruhstorfer ♂ Mindanao. Ent. Rundschau 30 p. 92.
As a race of *S. panda*, giving difference from *martia* (Basilan).
I cannot find this form sufficiently distinct to constitute a race apart from Philippines' *nathalia*.

1913 *substriata* van Eecke ♀ Po. Babi, Simalur. (1) Notes Mus. Leiden XXXV p. 202.
(2) Notes Mus, Leiden XXXVI p. 217 (1914).
(3) Zool. Meded. IV p. 76 and figure (1918).

At (1) he describes this as a ♀ var of *panda*.
At (2) he refers also to a ♂ from Sinabang which he allocates to the Nias race *schönbergi*.
At (3) he describes 2 ♂♂ from Po. Lasia and Po. Babi, two islets off Simalur. On Simalur there is a race closely resembling *schönbergi* and *chrysea*, but *substriata* from the islets "may easily be recognized by the absence of the failing brownish black colour on the costal and outer margins of the forewings. In one ♂ and the ♀ from Po. Babi we observe a grayish brown dust on the basal part and along the costa of the forewings". His coloured figure certainly shows quite different coloration from that of the two races mentioned, and also of *aurifolia*, being much less orange.

1932 *iwasakii* Sonan. ♀ Ishigaki I. (South Ryukyus, East of Formosa and just outside the tropics). Zephyrus IV p. 238, figured. A surprising extension of the genus and species. Described as a var. of *S. panda* from a single ♀ which, judging from the figures of upper and undersides, lacks vein 9 and resembles the Philippines race fairly well. Taken in 1927.

1954 **natunensis nov.** ♂, ♀ Great Natuna I.

Two ♂ ♂ and a ♀ at Tring labelled "Bunguran, Natuna Is./VII.X.94/(Hose)" represent a new orange race. ♂ above uniform dull orange, no basal dark dusting nor marked pale subcostal and apical areas; forewing costal and marginal black borders comparatively narrow. Below normal.

♀ above normal; below with a broad arcuate black band from near the base, under the costa and apex, to the tornus.

♂ holotype and ♀ allotype will be moved to the British Museum type collection; ♂ paratype at Tring.

1954 **dohertyi nov.** ♂ Sambawa.

No mention of any *Saletara* representatives in Sambawa has ever been made. The American collector Doherty touched on the subject in 1891 (J. Asiatic Soc. Bengal II p. 190) in a list of butterflies from Sumba and Sambawa. Dealing with *Appias* ("one of Hübner's silly genera, grounded on nothing whatever") *paulina*, he notices "two forms of this very puzzling group in both Sumba and Sambawa. One was all white, with only a slender dark marginal line, resembling *A. albina* ..... I have dubiously recorded from Sumba a ♀ which I supposed to be that of *A.* (*Saletara*) *nathalia*". I have found no ♀ ♀, but two ♂ ♂ labelled "Sambawa/Doherty/Sep. 91" are undoubtedly the first mentioned above and genuine *Saletara;* comparatively pallid above as

described, the forewing marginal border 1 mm., and the hindwing unmarked. Below plain dull cream. The ♂ holotype in the Br. Mus. is a rather small specimen; paratype at Tring. The ♀ should be interesting.

Summary

The large heterogeneous and cosmopolitan genus *Appias*, represented in Africa, Australia, and Asia to Japan, may require subdivision despite the reluctance of many authors to attempt this. *Saletara* is one outstanding such subdivision which all recent authors have accepted, several deliberately so while remarking on its indefinite foundation.

Though a naturally distinct genus, *Saletara* is only monospecific. Its one species, *S. liberia*, has two groups of races, the transition between them taking place in "Wallacea", between the Sunda and Sahul land Shelves.

The *panda* group of races, centred on Borneo, extends to the South Nicobars, the Mentawei Chain to Enggano, Natunas and Sula (insular, orange, races), and Peninsular Siam, Malaya, Sumatra to Sambawa, Celebes, Philippines and perhaps the Ryukyus (cream races).

The *liberia* race group centred on New Guinea is reached through the transitional area of the Moluccas and extends to the Solomons. These are the blue-gray races (there is a single cream ♂ in Br. Mus. labelled "Loyalty Is.". I suspect the label. It resembles Palawan specimens).

All races vary in ground colour. The *panda* races from cream to yellow, linked by intermediates whose forewings may be cream while hindwings are yellow. Orange races appear not to reflect this variation, but occasionally show a tendency to revert to cream colour. The *liberia* races vary mainly in the colour below, the hindwing from lemon to orange. The ♀ here is dimorphic, white or yellow without intermediates. In the transitional area the ♀ has a modified variation range, from dusty gray with heavy black markings through intermediates to white with black borders.

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My thanks are due to the Trustees and Staff of the British Museum (Natural History), both in London and at Tring, for full access to the collections and library, and for their ready assistance—without any of which this review could not have been attempted.

Races and subsidiary names of *Saletara liberia*. The letters refer to the map on page 173.

TABLE

A	*chrysea* Fruh.	South Nicobars	
B	*substriata* Eecke	Po. Babi; Po. Lasia (nr. Simalur)	Orange Races
C	*schoenbergi* Semper	Simalur; Nias; Batu Is.	
D	*aurifolia* (Fruh.)	Siberut	
E	*engania* Fruh.	Enggano	
F	*natunensis* ssp. nov.	Great Natuna	
G	*aurantiaca* Stgr.	Mangoli (Sula Is.)	
H	*distanti* Btlr.	Penin. Siam; Malaya; Sumatra; Borneo	
I	*panda* (Godt.)	Java	
J	*balina* Fruh.	Bali	
K	*dohertyi* ssp. nov.	Sambawa	
L	*nigerrima* (Holl.)	Celebes	
M	*erebina* Fruh.	Palawan; Balabac (syn. *hostilia* Fruh., Balabac)	
N	*nathalia* (C. & R. Feld.)	Philippines (Luzon) (synn. *panthea* (Wall.) Philippines; *nargosa* Fruh. Mindanao; *martia* Fruh. Bazilan.)	
O	*iwasakii* Sonan	Ishigaki (S. Ryukyus)	
P	*liberia* (Cr.)	Amboina; Ceram; Buru (syn. *chrysoberylla* Fruh., Buru.)	
Q	*eliada* (Hew.)	Batchian; Halmahera	
R	*obina* Fruh.	Obi Is.	
S	*cycinna* (Hew.)	Aru Is. (synn. *ocina* (Hew.), *chryselectra* Fruh.)	
T	*corinna* (Wall.)	Waigeou I.; New Guinea	
U	*gisco* (Gr. Sm.)	Solomon Is.; Bismark Is.	

(21 races, 7 synn.)

The names of forms may be applied as follows:—

Cream races, ♂ & ♀; Light forms *nivaria* Fruh., yellow forms *sulphurea* (Voll.)

Moluccas races, ♀; Light forms *pseudocorinna* Fruh., dark forms *obina* Fruh.[1]

Blue-gray races, ♀; White forms *ocina* (Hew.) (syn. *hastia* Fruh.) yellow forms *flavescens* (Ribbé)

1. Intermediates between *pseudocorinna* and *obina* are *vada* Fruh. & *principalis* Fruh.