

XLIV.—On the Pierine Butterflies of the Genus *Catophaga*.

By ARTHUR G. BUTLER, Ph.D., F.L.S., F.Z.S., &c.

WHEN Wallace described his extensive genus *Tachyris*, based chiefly upon the tuft at the base of the claspers in the males, he seems to have been unaware that Hübner had already proposed three generic names, viz. *Appias*, *Catophaga*, and *Hiposcritia* (recte *Hyposcritia*) for species having this secondary sexual character.

I find that *Appias* (type *A. zelmira*) is undoubtedly generically distinct, the club of the antennæ being broadly spoon-shaped and flattened; but I see no reason for regarding *Catophaga*, *Hiposcritia*, and *Tachyris* (restricted) as more than groups of one genus, differing chiefly in outline of wing and style of coloration. In the case of *Saletara* the structural difference in neurulation is inconstant, and consequently only of subgeneric value; I therefore regard this also as a group, though perhaps a little better defined than the others.

Group 1. HYPOSCRITIA, Hübn.

The species of this group have the apex of the primaries usually more or less falcate; the males of the wet-season phase are either cream-coloured or ochraceous on the under surface of the secondaries, rarely (perhaps never) heavily speckled or striated; whereas the dry-season phase of the male more or less resembles a dead leaf in tint on the under surface.

Type of the group *H. pandione*.

1. *Hyposcritia indra*.

Pieris indra, Moore, Cat. Lep. E. I. C. i. p. 74 (1857); P. Z. S. 1857, p. 103, pl. xlv. fig. 5.

Appias mahana, Moore, Ann. & Mag. Nat. Hist. ser. 4, vol. xx. p. 48 (1877).

Appias imbecilis, Moore, Journ. As. Soc. Beng. liii. p. 46 (1884).

Tachyris indigis, Weymer, Stett. ent. Zeit. 1886, pl. i. fig. 3, 1887, p. 11.

N.E. India and Burma. ♀, type, B. M.

We have one male labelled "Celebes," but I believe this to be an error; it was received from the Godman and Salvin collection (ex coll. Druce). *H. indra* is the wet-season phase, *H. mahana* dry, *H. imbecilis*=*indigis* an extreme dry phase.

2. *Hyposcritia shiva*.

Hyposcritia shiva, Swinhoe, P. Z. S. 1885, p. 138, pl. ix. figs. 1, 2.

Poona, Manipur, and Burma. ♂, type, B. M.

The female much resembles that sex of *H. leptis* on the upper surface, but the male looks like *H. indra* starved.

3. *Hyposcritia narendra*.

Hyposcritia narendra, Moore, Ann. & Mag. Nat. Hist. ser. 4, vol. xx. p. 48 (1877).

Ceylon. B. M.

Var. (?). Nilgiris. B. M.

I have only seen dry forms of this species; the Nilgiri type may possibly be a large form of *H. shiva*, which it resembles almost as closely as it does the Ceylonese species.

4. *Hyposcritia leptis*.

Pieris leptis, Felder, Reise der Nov., Lep. ii. p. 163 (1865).

Tachyris Lucasii, Wallace, Trans. Ent. Soc. ser. 3, vol. iv. p. 381 (1867).

Java. Wet-season phase, B. M. Dry-season phase, coll. Hewitson.

5. *Hyposcritia plana*.

Appias plana, Butler, Trans. Linn. Soc. 2, Zool. i. p. 551 (1879).

Borneo, Sumatra, Malacca, Batchian. Type, B. M.

I have only seen the wet-season phase of this species, and it is possible that no dry phase may exist.

6. *Hyposcritia pandione*.

Hiposcritia pandione, Hübner, Zutr. exot. Schmett. figs. 651, 652 (1832).

Pieris ida (?), Lucas, Rev. et Mag. de Zool. 1852, p. 335.

Java. B. M.

I have only seen a dry phase of this species; but it is quite likely that *H. ida* may be the wet-season form.

7. *Hyposcritia Whiteheadi*.

Appias Whiteheadi, Grose-Smith, Ann. & Mag. Nat. Hist. ser. 5, vol. xx. p. 434 (1887); Rhop. Exot. i., *Pier.* ii. figs. 4, 5 (1889).

Kina Balu. B. M.

8. *Hyposcritia montana*.

Appias montanus, Rothschild, Nov. Zool. iii. p. 325 (1896).

Philippines.

I have not seen this species, but it is said to be related to *H. phæbe*.

9. *Hyposcritia* (?) *ambigua*.

Appias ambigua, Grose-Smith, Nov. Zool. ii. p. 76 (1895).

Wetter, Dili, and Gilolo.

Judging from the description, I imagine that this must be a *Hyposcritia*; but no hint of its affinities is given.

10. *Hyposcritia phæbe*.

Pieris phæbe, Felder, Wien. ent. Monatschr. v. p. 299 (1861); Reise der Nov., Lep. ii. p. 163, pl. xxv. fig. 5 (1865).

Philippines.

Not in the Museum collection.

11. *Hyposcritia lagela*.

Catophaga lagela, F. Moore, P. Z. S. 1878, p. 838.

Tenasserim. Type, B. M.

12. *Hyposcritia lalage*.

Pieris lalage, Doubleday in Gray's Zool. Misc. p. 76 (1842); Doubleday and Hewitson, Gen. Diurn. Lep. pl. vi. fig. 5 (1847).

Pieris durvasa, Moore, Cat. Lep. E. I. C. i. p. 73 (1857); P. Z. S. 1857, p. 103, pl. xlv. fig. 6.

Catophaga pseudolalage, Moore, P. Z. S. 1879, p. 142.

Hyposcritia argyridina, Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. xvi. p. 340 (1885).

N.E. India to E. Pegu. ♀, type, B. M.

H. durvasa is the extreme wet-season form of the species; *H. lalage* (typical) is also a wet-season phase, probably appearing at the end of the rains; *H. pseudolalage* is a smaller form, probably occurring at the commencement of the dry season; and *H. argyridina* is a true dry-season phase.

13. *Hyposcritia indroides*.

Pieris indroides, Honrath, Berl. ent. Zeitschr. xxxiii. p. 403 (1889).

Perak.

Not in the Museum collection. Weymer says that it is the *H. lalassis* of Grose-Smith, but I cannot agree with him.

14. *Hyposcritia lalassis*.

Appias lalassis, Grose-Smith, Ann. & Mag. Nat. Hist. ser. 5, vol. xx. p. 265 (1887); Rhop. Exot. i., *Pier.* pl. ii. figs. 1-3 (1889).

East Pegu and Burma. 2 ♂, B. M.

Group 2. CATOPHAGA, Hübn.

In this, the typical group, the primaries show little tendency to falcation at apex, the sexes are usually very dissimilar, and the colouring of secondaries below varies seasonally from ochraceous or yellow to pearl whitish.

1. *Catophaga ega*.

Pieris ega, Boisduval, Sp. Gén. Léop. i. p. 536 (1836).

Pieris melania, var. *caledonica*, Felder, Verh. zool.-bot. Ges. Wien, xii. p. 495 (1862).

Pieris psyche, Felder, Reise der Nov., Lep. ii. p. 166 (1865).

Australia to New Caledonia and the Loyalty group. B. M.

This species apparently varies but little, all the specimens which I have seen showing a wet-season character. There are forty-two examples in the Museum series.

2. *Catophaga agave*.

Pieris agave, Felder, Wien. ent. Monatschr. vi. p. 286 (1862).

Tachyris alope, Wallace, Trans. Ent. Soc. ser. 3, vol. iv. p. 372 (1867).

Tachyris mata (?), Kheil, Lep. Ins. Nias, p. 34, pl. iv. fig. 21 (1884).

Tachyris agatha, Staudinger, Iris, 1889, p. 20.

Malacca, Java (Nias?), Borneo, Philippines. B. M.

Kheil's illustration agrees well with one of our male examples; but in his description he calls the upper-surface coloration hoary greyish, and he states that it belongs to the *T. celestina* group, in which (as is well known) the upper surface is pale chalky bluish. The figure, being a photograph, distinctly proves that "*T. mata*" is not a *Tachyris*, but a male *Catophaga*, and therefore that it is not nearly related to *T. celestina*, the dusky spot on the primaries being placed between veins 3 and 4, not between 4 and 5; and my opinion is that it is merely a feebly marked (perhaps dry-season) discoloured male of *C. agave*. I believe Staudinger's *Tachyris agatha* to be a variety of the female. The *Tachyris maculata* of Grose-Smith (compared with *C. agave*) appears to me to be closely related to *Huphina acrisa*, Boisd.

3. *Catophaga urania*.

♂. *Tachyris urania*, Wallace, Trans. Ent. Soc. ser. 3, vol. iv. p. 371 (1867).

♀. *Appias Dohertyi*, Rothschild, Deut. ent. Zeit., Lep. v. p. 441, pl. v. fig. 1 (1892).

♂, Celebes (ex coll. Godm. & Salv.). Type, coll. Hewitson.

I have not seen the female of this species, but believe *A. Dohertyi* to represent that sex.

4. *Catophaga melania*.

♀. *Papilio melania*, Fabricius, Syst. Ent. p. 475 (1775).

Appias melania, Butler, Cruise of the 'Curaçoa,' p. 471, pl. xlix. figs. 4, 5 (1873).

♂. *Pieris zoe*, Vollenhoven, Mon. Pier. p. 37, pl. iv. fig. 3 (1865).

♀ (as ♂). *Tachyris asteria*, Miskin, Proc. Linn. Soc. N. S. W. 2, iii. p. 1514 (1888).

Type, ♀, coll. Banks; 2 ♂, 2 ♀, Batchian, colls. Hewitson and B. M.

The secondaries of the female vary much in colouring on the upper surface, but whether the differences are seasonal or not is not known; one of our examples has these wings bright yellow, with the usual broad deep brown borders. I think *T. asteria* is only a variety of this sex.

5. *Catophaga Jacquinetii*.

♂. *Pieris Jacquinetii*, Lucas, Rev. et Mag. de Zool. 1852, p. 326.

♀. *Appias korridana*, Grose-Smith, Novit. Zool. i. p. 335 (1894).

♂, Ceram; ♀, Biak, New Guinea. B. M.

A local representative of *C. melania*.

6. *Catophaga galathea*.

♂. *Pieris galathea*, Felder, Reise der Nov., Lep. ii. p. 165 (1865).

Catophaga Roepstorffii, Moore, Journ. As. Soc. Beng. lii. p. 44 (1884).

♂, Camorta. B. M.

I consider typical *C. galathea* to be the wet- and *C. Roepstorffii* the dry-season phase.

7. *Catophaga sawela*.

Tachyris sawela, Frühstorffer, Soc. Ent. 14, xi. pp. 115, 116 (1896); Berl. ent. Zeitschr. xli. p. 390, pl. ix. fig. 8, ♀ (1897).

♂ ♀, Lombock (*Frühstorffer*). B. M.

8. *Catophaga eurosundana*.

Appias eurosundana, Grose-Smith, Novit. Zool. ii. p. 75 (1895).

Timor, Sambawa, and Wetter.

Said to be nearly related to *C. paula*, which it nearly resembles in both sexes.

9. *Catophaga paula*.

Catophaga paula, Röber, Tijds. Ent. xxxiv. p. 282, xxxv. pl. iv. figs. 1, 2 (1892).

Wetter.

This species seems nearly related to the preceding, but I have not seen examples.

10. *Catophaga paulina*.

♀. *Papilio paulina*, Cramer, Pap. Exot. ii. pl. cx. E, F (1779).

Catophaga leis, Hübner, Zutr. exot. Schmett. figs. 771, 772 (1832).

♂. *Pieris darada*, Feld. Reise der Nov., Lep. ii. p. 166 (1865).

♂ ♀. *Catophaga lankapura*, Moore, P. Z. S. 1879, p. 142.

N.W. and N.E. Provinces of India, Burma, Tonkin, Ceylon, Penang, Java, Borneo. B. M.

I regard *C. lankapura* as the wet-season phase, *C. paulina* intermediate, and *C. leis* = *darada* as the dry-season phase.

11. *Catophaga albina*.

♂. *Pieris albina*, Boisduval, Sp. Gén. Léop. i. p. 480 (1836).

♂. *Pieris Rouxii*, Boisduval, t. c. p. 481 (1836).

♀. *Pieris neombo*, Boisduval, t. c. p. 539 (1836).

♂. *Pieris galene*, Felder, Reise der Nov., Lep. ii. p. 165 (1865).

♂. *Tachyris albata*, Hopffer, Stett. ent. Zeit. 1874, p. 22.

♀. *Catophaga venusta*, Moore, Lep. Ceylon, i. p. 132, pl. li. fig. 3 (1880-81).

Ceylon, Southern and Eastern India, Pegu, Burma, Tonkin, Philippines, Batchian, Ceram, Bourou, Celebes, Borneo, Penang, Sumatra, Java, Timor-Laut, and Northern Australia. (81 examples.) B. M.

I take the representative of the extreme wet-season phase to be that in which the male has the secondaries and apex of primaries below butter-yellow and the female a bright daffodil-yellow above, with the secondaries and apex of primaries below bright ochreous. Flying with this form *C. neombo* is obtained (an intermediate phase), in which the female is milky white, the male below with the secondaries and apex of primaries sericeous cream-coloured, varying to pale ochreous, and the female with the same parts pearl-white;

the dry form is represented by *C. albina* and *Rouxii*, in which the dusky border of the male primaries is either almost wholly absent or is reduced to a slender abbreviated black marginal line, and the female differs from *C. neombo* in the reduction of the black markings on the upper surface.

Whether *C. albina* is really a distinct species from *C. paulina* can only be finally settled by breeding from the egg; the *C. leis=darada* form runs *C. neombo* rather close in both sexes.

12. *Catophaga Wardii*.

Catophaga Wardii, Moore, Journ. As. Soc. Beng. lii. p. 43 (1884).

Nilgiris, Mysore, Rangoon. B. M.

What I take to be wet-season males of this species resemble females of *C. neombo* in the character of the upper surface. I am not sure that two females without locality standing next to the male of this species in Hewitson's collection do not represent the wet-season phase of the female, the secondaries and apex of primaries below being deep orange; but they may be merely unusually large examples of female *C. lankapura*. I think *C. Wardii* is a good species, distinct from *C. paulina*.

13. *Catophaga cynisca*.

♀. *Tachyris cynisca*, Wallace, Trans. Ent. Soc. ser. 3, vol. iv. p. 375 (1867).

Tachyris agatha, Staudinger, Deut. ent. Zeit., Lep. 1889, p. 20.

Bourou. Type, coll. Hewitson.

14. *Catophaga maria*.

Tachyris maria, Semper, Stett. ent. Zeit. 1875, p. 405; Reisen im Arch. Philipp. vol. v. p. 247, pl. xxxix. figs. 1-4 (1891).

Philippines. B. M.

The male has a female character of upper surface.

15. *Catophaga saina*.

Appias saina, Grose-Smith, Novit. Zool. i. p. 336 (1894).

New Guinea.

16. *Catophaga athama*.

♀. *Pieris athama*, Lucas, Rev. et Mag. de Zool. 1852, p. 336; Herrich-Schäffer, Aus. Schmett. ii. fig. 104 (1869).

♂. Above milky white; costal border grey almost to end of cell, thence black-edged to apex and along outer margin

to first median branch : under surface with the secondaries and apex of primaries creamy buff, shading into brighter yellow on the borders.

Samoa. 3 ♂, 3 ♀, B. M.

17. *Catophaga Wallacei*, sp. n.

♀. *Tachyris athama*, Wallace, Trans. Ent. Soc. ser. 3, vol. iv. pl. ix. fig. 1 (1867).

♂. Chiefly differing from that sex of the preceding species in its more acute primaries.

Mallicollo, New Hebrides, and New Caledonia. B. M.

When describing the female of this species Wallace commented upon its differences from M. Lucas's description and figure, and indeed admitted that the latter was "hardly recognizable" as the same insect. As subsequently evidenced by Herrich-Schäffer's second figure and by three typical females now in the Museum, the illustration criticized by Wallace was an accurate one, and therefore not the same insect as the female figured by himself from New Caledonia.

Group 3. SALETARA, Dist.

The species all have acutely triangular wings with tolerably regular external blackish borders and a good deal of yellow of various shades on the under surface ; the females vary a good deal in the colouring of the upper surface, the differences being probably seasonal ; there seems, however, very little to distinguish the supposed seasonal phases of the males excepting in *S. nigerrima*.

This group was erected into a genus on the ground that in some of the species the males show an extremely short terminal furcation of the third subcostal branch. This character, however, is not only valueless for generic, but for specific differentiation, inasmuch as males of the Malayan representative of *S. panda* sometimes have it well marked and sometimes show no trace of it, proving clearly its unstable, individual, and therefore utterly unreliable nature. As a group, however, it is a natural one, but characters have yet to be discovered which will warrant its being called a distinct genus.

1. *Saletara corinna*.

♂ ♀. *Tachyris corinna*, Wallace, Trans. Ent. Soc. ser. 3, vol. iv. p. 377 (1867).

Port Moresby, New Guinea. 6 ♂, 1 ♀, B. M.
Described from Waigiou.

2. *Saletara cycinna*.

♂. *Pieris cycinna*, Hewitson, Exot. Butt. ii., *Pier.* pl. iv. figs. 23, 26 (1861).

♀. *Pieris ocina*, Hewitson, *l. c.* figs. 24, 25 (1861).

Aru Islands. 3 ♂, 2 ♀, B. M.

The upper surface of the female varies from white to yellow.

3. *Saletara liberia*.

Papilio liberia, Cramer, Pap. Exot. iii. pl. ccx. G, H (1782).

Ceram. 7 ♂, 2 ♀, B. M.

4. *Saletara eliada*.

Pieris eliada, Hewitson, Exot. Butt. ii., *Pier.* pl. iv. figs. 27, 28 (1861).

Batchian. 5 ♂, B. M.

5. *Saletara nathalia*.

Pieris nathalia, Felder, Wien. ent. Monatschr. vi. p. 285 (1862).

♀. *Tachyris panthea*, Wallace, Trans. Ent. Soc. ser. 3, vol. iv. p. 376 (1867).

Philippines. 12 ♂, 8 ♀, B. M.

6. *Saletara Distanti*, sp. n.

The males sometimes with and sometimes without a terminal furcation of the third subcostal branch of the primaries; the secondaries and sometimes all the wings often tinted with sulphur; the females varying from white to yellow, the outer borders narrower (usually considerably so) than in *S. nathalia*, and the pale areas consequently broader; the under surface in both sexes (excepting in what I take as the dry phase of the female) more suffused with bright ochreous.

Expanse of wings, ♂ 54-64, ♀ 59-64 millim.

Malacca, Singapore, Sumatra, Borneo. 9 ♂, 8 ♀, B. M.

7. *Saletara panda*.

♂. *Pieris panda*, Godart, Enc. Méth. ix. p. 147 (1819).

♀. *Pieris sulphurea*, Vollenhoven, Mon. Pier. p. 32, pl. iv. fig. 4 (1865).

Java. 5 ♂, 4 ♀, B. M.

The males of this species are always more or less suffused with sulphur-yellow, and I have seen no white forms of the female; the outer border in this sex is narrower than in the preceding species, and the ochreous suffusion of the under surface in both sexes is more marked.

8. *Saletara gisco*.

♂. *Appias gisco*, Grose-Smith, Ann. & Mag. Nat. Hist. ser. 6, vol. xv. p. 229 (1895).

Solomon Islands.

Allied to *S. panda*, and said to resemble the female of that species on the upper surface.

9. *Saletara nigerrima*.

♀. *Appias panda*, var. *nigerrima*, Holland, Proc. Bost. Soc. xxv. p. 76, pl. iv. fig. 3 (1891).

♂. *Saletara Schombergi*, Semper, Reisen im Arch. Philipp. vol. v. p. 249 (1891).

♂. *Tachyris aurantiaca*, Staudinger, Deut. ent. Zeit., Lep. vii. p. 352 (1894).

Celebes and Sula Islands. B. M.

Our male from the Celebes is white above and nearly resembles *S. nathalia*. I consider this as probably the male of the wet phase and Dr. Holland's female as belonging to the same phase. *S. Schombergi* from Borneo and *S. aurantiaca* from the Sula Islands probably represent the dry phase, which will doubtless be found in the Celebes also.

[To be continued.]

XLV. — *New North-American Insects*. By T. D. A. COCKERELL, Entomologist of the New Mexico Agricultural Experiment Station.

IX.—*Two new Coccidæ of the Genus Orthezia*.*Orthezia garryæ*, sp. n.

♀ (adult).—Length about $2\frac{1}{2}$ millim., with ovisac about 7 millim.

Body pale pea-green; ovisac strongly curved upwards, composed of ribbon-like longitudinal bands, which are contiguous, but little or not coherent; lateral dorsal areas only clothed with thin meal; middle of back with a double crest of long erect white lamellæ; sides with long thick curling white lamellæ, the two at the beginning of the ovisac on each side very long and curving downwards over the side of the ovisac; caudal lamellæ rather short; legs light brown, femora and ends of tarsi piceous; the legs measure as follows in μ u:—femur + trochanter 746; tibia 696–779; tarsus 381; claw 90.



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