

# Revisional notes on *Coladenia* Moore, 1881 (Lepidoptera: Hesperiiidae)

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The species of *Coladenia* Moore, 1881, occurring in the Philippines are revised. The following species are shown to occur there: *C. igna* (Semper, 1892), *C. semperi* Elwes & Edwards, 1897, *C. minor* Chiba et al., 1991, and *C. palawana* (Staudinger, 1889). Two new species are added: *C. ochracea* and *C. similis*, and the new subspecies of *C. igna marinda*, is described. Due to the incorrect identification of the Sundaland form of *C. agni* (de Nicéville, 1883) as the Philippine *C. igna* by Evans (1949), the former was still unnamed; it is named *C. agni sundae* here.

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## Introduction

In the genus *Coladenia* Moore, 1881, twelve species have been recognized so far. The genus is distributed through most of the Oriental Region while four species are restricted to China. Most species are rare in collections. Evans (1949) recorded three species from the Philippines, viz. *C. agni igna* (Semper, 1892), *C. palawana* (Staudinger, 1889), and *C. kehelatha* (Hewitson, 1878). Unfortunately, the identifications were based on misinterpretations of the literature. Moreover, Evans did not study the relevant types. Chiba et al. (1991) described a new species from the Philippines, *C. minor*, but since they did not study the types of the Philippine taxa either, they introduced a further error.

While preparing a synoptic paper on the Philippine Hesperiiidae and their distribution we did check the relevant types as well as new material. As a consequence it seems useful to revise the Philippine species. We describe two new species and a new subspecies, and we give a name to a Sundaland form that was incorrectly identified as belonging to a Philippine taxon.

The depositories of the material studied are abbreviated as follows: BM(NH) — Natural History Museum (formerly British Museum (Natural History)), London; CGT — Coll. C.G. Treadaway, Limbach-Wagenschwend (Germany); RMNH — Nationaal Natuurhistorisch Museum (formerly Rijksmuseum van Natuurlijke Historie), Leiden; SMF — Naturmuseum Senckenberg, Frankfurt am Main; ZMB — Zoologisches Museum der Humboldt-Universität, Berlin.

## *Coladenia igna* (Semper, 1892)

*Tapena igna* Semper, 1892: 316 (p.p.).

*Coladenia agni igna*; Evans, 1949: 116.

*Coladenia igna*; Swinhoe, 1913: 71; Chiba et al.: 59.

Type series.— Semper had three males, from Luzon and East Mindanao. He compared them with specimens of *C. agni* (de Nicéville, 1884) from Sikkim and found the following differences: — ground colour with a more greenish tinge; — hyaline spots with a yellowish tinge; — hyaline spots more separate; — series of black dots on hindwing on the upper as well as the underside closer to termen; — fringes unicoloured brown (in *C. agni* they are whitish at tornus of forewing and apex of hindwing); — on underside of forewing a white spot at tornus (only weakly indicated in *C. agni*).

The latter character should in itself be sufficient to understand that *C. igna* is not conspecific with *C. agni*. Evans (1949), who listed *igna* as a subspecies of *agni*, recorded this spot as absent in *agni*, thus demonstrating that he had not understood the original description of *igna*.

The three type-specimens are in the Senckenberg Museum, Frankfurt am Main. They do not bear locality labels; this is most unfortunate. Not only did Semper (1892) state that they originated from two islands, but they turn out to belong to two species. One of the specimens bears the labels "Type" (red, printed) and "*Tapena igna* typ. Semper" (hand-written). We have selected this specimen as lectotype. It agrees with the description except for the hyaline spots being white. One other specimen is similar, but has smaller spots. The third specimen has the spots larger than the lectotype. The cell spot reaches farther to the wing base than the spot in space 2 (in the other two specimens the inner edges of the cell spot and the spot in space 2 are in line). The spots are yellow and the whole superscaling is more yellowish. There are, moreover, differences in the genitalia, see below. We conclude that the white-spotted specimens are true *C. igna*, while the yellow-spotted specimen belongs to another species, to be described below. We cannot be sure about the origin of the lectotype, but since it was labeled "type" and Semper mentioned Luzon first, it seems likely that it came from Luzon, and the yellow-spotted specimen from East Mindanao.

External characters.— Length of forewing 18.9-19.8 mm. Upperside forewing dark brown with indistinct olive-green superscaling, white hyaline spots in spaces 1b (double spot, may be absent), 2, 3, 6 (dot), 7 (very small or absent), 8 (as in 6), and 11 (over cell spot); the inner edges of the spots in space 2 and cell are in line; the spot in space 7 displaced inwards; the spot in space 2 is at least as big as the cell spot; there is a dark subbasal spot in space 1b. Upperside hindwing with olive-green superscaling leaving a well-defined series of black spots in spaces 1c to 7, an indistinct dark spot in the cell, and a very indistinct dark spot near the base of space 7; there is a dark terminal line followed by a narrow olive-green line at the base of the fringes. Underside forewing as upperside, darker due to absence of lighter superscaling, a distinct white tornal spot in space 1b, distally of the double hyaline spot in that space and also present if the latter is absent. Underside hindwing as upperside, a bit darker.

Male genitalia (fig. 1).— Uncus triangular in dorsal view, but apex expanded laterally, so that it looks squarish with a central and two lateral tips, all three rounded. Gnathos with a single, median, ventral process, rasp-like. Valva with cucullus elongate, distally bent up and ending in two sharp points; costa convex, extended distally into a finger-like process that points slightly upwards and does by a considerable

degree not reach as far as apex of cucullus. Aedeagus without lateral serrate process, but with a dorso-lateral thickened ridge.

Distribution and variation.— The species is known from Luzon (?), Marinduque and Samar. The specimens from Marinduque are quite different in having much larger hyaline spots. Therefore we distinguish two subspecies.

### ***Coladenia igna igna* (Semper, 1892)**

Material.— 1 ♂ lectotype, 1 ♂ paralectotype, Luzon (?) (SMF); 1 ♂, Samar (RMNH).

External characters (fig. 8).— Hyaline spots well-separated, spot in space 2 distinctly shorter than its distance from termen.

### ***Coladenia igna marinda* subsp. nov.**

Material.— Holotype, ♂, Marinduque, Mt. Malindig, April 1991, (CGT). Paratypes: 1 ♀, same data as holotype (CGT); 1 ♂, same data as holotype (RMNH).

External characters (fig. 9).— Hyaline spots large, those in space 2 and cell only narrowly separated by dark vein, spot in space 2 at least as long as its distance from termen.

### ***Coladenia agni* (de Nicéville, 1884)**

*Plesioneura agni* de Nicéville, 1884: 87.

*Coladenia agni*; Swinhoe, 1913: 68; Evans, 1932: 341; 1949: 116.

Evans (1949: 116) recognized two subspecies for *C. agni*, the nominotypical one, found from Sikkim and Assam to SE Thailand and Hainan, and *C. a. igna*. As explained above the latter name relates to a different species that is endemic to the Philippines. As a consequence the population of *C. agni* in Sundaland (Malaysia, Sumatra, Java, Borneo) is without a name. It is named and described below. The genitalia (fig. 2) of both subspecies are similar.

The species can easily be distinguished from *C. igna* by the series of black dots on the hindwing being halfway between cell and termen or rather closer to the cell, while in *C. igna* the spots are distinctly closer to the termen.

### ***Coladenia agni agni* (de Nicéville, 1884)**

*Coladenia agni agni*; Evans, 1949: 116; Pinratana, 1985: 35.

Material.— 39 ♂♂, 11 ♀♀. 23 ♂♂, 6 ♀♀, Sikkim; 6 ♂♂, 1 ♀, Assam, 10 ♂♂, 2 ♀♀, Burma (Karens, Ataran, Tavoy); 1 ♀, SE. Thailand (Chatnaboon, Khao Sabab); 1 ♀, Hainan [all BM(NH)].

External characters.— Length of forewing ♂ 15.5-19 mm, ♀ 17.7-19.2 mm. On the average upperside not as dark as in the other subspecies due to suffusion with ochre-

ous scales, especially on the hindwing, strongest in specimens from Sikkim. Hyaline spots variable, usually more or less contiguous, proximal edge of spot in space 2 under proximal half of lower edge of cell spot. Cilia of forewing paler at space 1b, of hindwing conspicuously paler at spaces 6 and 7. Termen of hindwing not regularly curved, slightly produced at vein 4.

Distribution.— See Material.

### *Coladenia agni sundae* subsp. nov.

*Coladenia agni igna*; Evans, 1949: 116; Fleming, 1975: 60; Eliot, 1978: 458; Pinratana, 1985: 35; Maruyama, 1991: 14 (misprint: "*igana*").

Material.— Holotype: ♂, Sumatra, Kuala Simpang, Gedong Biara, 3-i-1953, leg. R. Straatman (RMNH). Paratypes: 1 ♂ W. Sumatra, Lebong Tandai; 1 ♂, 1 ♀, NE. Sumatra, Battak Mts; 1 ♂, Java, Ardjoeno, 1200-1500 m; 1 ♂, Borneo, Kinabalu (all BM(NH)).

External characters.— Length of forewing ♂ 16.1-17.8 mm, ♀ 18.7 mm. Upperside darker than in *C. a. agni*. Hyaline spots not contiguous, proximal edge of spot in space 2 under middle of lower edge of cell spot. Cilia of forewing at space 1b and of hindwing at spaces 6 and 7 hardly paler than rest of cilia. Termen of hindwing regularly curved.

Distribution.— The type material originates from the three Greater Sunda Islands. In the BM(NH) there is a female from Malaysia, Selangor, Ulu Langat, that is intermediate between the two subspecies. It is small (length of forewing 16.5 mm) and dark, with cilia as in *C. a. sundae*, but the hyaline spots and the shape of the hindwing are as in *C. a. agni*.

### *Coladenia ochracea* spec. nov.

*Tapena igna* Semper, 1892: 316 (p.p.).

Material.— Holotype: ♂, C. Leyte, Mt. Balocaue, Hilusig, 600 m, 29.v.1988 (CGT). Paratypes: 1 ♂, same data as holotype (CGT); 1 ♂, C. Leyte, Mt. Balocaue, Mahaplag, 600 m, 9.v.1986 (RMNH); 1 ♂ same data, but 6.ix.1986, and 1 ♂ same data but 700 m, 31.vii.1985 (CGT); 1 ♂, Mindanao (?) (paralectotype of *Tapena igna* Semper) (SMF).

External characters (fig. 10).— Length of forewing 18.4-19.8 mm. Upperside forewing brown with yellow superscaling; pale yellow hyaline spots in spaces 2, 3, 6, 7, 8, and 11, and in cell; spots in spaces 2 and 3 and in cell fairly close together, but still obviously separated; spot in space 2 hardly smaller than cell spot, spot in space 3 much smaller; dark subbasal spot in space 1b; sometimes very small hyaline dots in space 1b under outer part of spot in space 2, and in space 5; series of very indistinct, lighter, submarginal spots. Upperside hindwing with strong yellow superscaling, leaving a dark terminal band, a series of dark brown spots in spaces 1c to 7, a subbasal dark spot in space 7, and a dark spot in cell. Underside forewing as upperside; submarginal double spot in space 1b (tornal spot) rather conspicuous, better marked than the other submarginal spots. Underside hindwing as upperside, but darker.

Male genitalia (fig. 3).— Uncus, gnathos and aedeagus as in *C. igna*. Valva with cucullus elongate, tapering to a serrate, pointed apex that does not bend up; costa convex, extended into a long narrow process that reaches almost as far as apex of cucullus.

**Coladenia semperi** Elwes & Edwards, 1897

*Coladenia semperi* Elwes & Edwards, 1897: 128; Swinhoe, 1913: 71.

not *Coladenia semperi*; Chiba et al., 1991: 59.

*Tapena laxmi*; Semper, 1892: 316 (p.p.).

*Coladenia kehelatha* (Hewitson, 1878); Evans, 1949: 117.

Material.— 1 ♂, Camiguin de Mindanao (holotype; SMF); 1 ♂, Leyte, Mt. Balocaea, Mahaplag, 700 m, 5.viii.1985 (CGT).

Under the name of *Tapena laxmi* (de Nicéville, 1888) Semper (1892) listed five specimens from the Philippines. They came from Luzon (1 ♂, 1 ♀), SE. Mindanao (1 ♂) and Camiguin de Mindanao (2 ♂ ♂). They are all in the Senckenberg Museum, Frankfurt am Main. Elwes & Edwards (1897) found the series to consist of two species, one of which (a ♂ from Camiguin de Mindanao) was undescribed. They described it as *Coladenia semperi*. Apparently Evans (1949), without having seen the material, concluded that Semper had misidentified his specimens and that they actually belonged to *C. kehelatha*. That can be the only reason why he synonymized *C. semperi* and *C. kehelatha*. As it turns out now, *C. semperi* is a separate species and the other four specimens were neither *C. laxmi* nor *C. kehelatha*, but an undescribed species. Apparently Chiba et al. (1991) misunderstood the action by Elwes & Edwards and figured the undescribed species under the name of *C. semperi*.

External characters (fig. 11).— Holotype. Length of forewing 18.7 mm. Upperside of forewing similar to *C. ochracea*, but pale yellow hyaline spots much smaller, spot in space 2 much smaller than cell spot and only slightly larger than spot in space 3; spots in spaces 6, 7, 8 and 11, however, well-developed, those in spaces 6 and 8 as large as spot in space 3; subbasal dark spot in space 1b more conspicuous than in *C. ochracea*. Upperside of hindwing with strong yellow superscaling leaving a narrow dark terminal area, dark median spots in spaces 1c to 7, subbasal spots in spaces 1c and 7, and in cell; the spots are more or less conjoined into two irregular bands (in *C. ochracea* they are clearly separate); the median spots are placed further from the termen than in *C. ochracea*, the median spot in space 1c is strongly displaced inward. Underside of forewing as upperside, subbasal spot in space 1b conspicuous, also a dark median spot in space 1b, from vein 1 to vein 2, replacing hyaline spots here; no light tornal spot. Underside of hindwing as upperside, but without yellow superscaling.

Male genitalia (fig. 4).— Uncus triangular, as in *C. minor* (figures in Chiba et al., 1991). Gnathos ventrally with two rasp-like processes which are connected proximally by a band that is about as broad as the processes. Valva, cucullus curving inwards, rounded, slightly serrate dorsally, costa distally ending in a well-marked upright tooth (already mentioned by Elwes & Edwards, 1897, in their key to the species of *Coladenia*: "Upper edge of clasp with one small sharp triangular tooth near the middle"). Aedeagus as in *C. minor*, with the serrate process on the left side.

Variation.— The specimen from Leyte is similar to the holotype, also in the genitalia, but ground colour and superscaling are much darker. Since the ages of the specimens differ about 100 years and the colour of the type probably has faded a bit, and because there is no further material for comparison, we refrain from describing the Leyte specimen as a separate subspecies.

Distribution.— Only known from Camiguin de Mindanao (type-locality) and

Leyte (see Material).

Note.— Externally *C. semperi* is very similar to *C. minor*. They are both characterized by the small size of the spots in spaces 2 and 3 of the forewing, hardly if at all larger than the spots in spaces 6 and 8. In *C. semperi* the black dots on the hindwing are better marked and more or less separate, while in *C. minor* there is a vaguely outlined dark band. For the differences in the genitalia, see the description and figures 4 and 5.

### *Coladenia minor* Chiba, Nakanishi, Fukuda & Yata, 1991

*Coladenia minor* Chiba, Nakanishi, Fukuda & Yata, 1991: 59.

Material.— 2 ♂♂, Luzon, Quezon Nat. Park (CGT, RMNH).

The species is very similar to *C. semperi* and since the two species are allopatric, we would have placed *C. minor* as a subspecies of *C. semperi*, if not the valvae had shown considerable differences. The apparent allopatry may be a product of the rarity of the species and not the real situation.

External characters (fig. 12).— Length of forewing 17.8 mm. Upperside of forewing very much like *C. semperi*; hyaline spots a slightly darker shade of yellow, those in spaces 2 and 3 not larger than those in spaces 6 and 8; dark subbasal spot in space 1b inconspicuous. Upperside of hindwing with strong yellow superscaling leaving a dark terminal band, a vaguely outlined median band that is serrate on both sides, and an inconspicuous band from space 1c through cell to space 7. Underside of forewing as upperside, darker due to absence of yellow scales, dark spots in space 1b very inconspicuous, if present at all. Underside of hindwing dark brown with inconspicuous dark spots, best developed in spaces 1c (subbasal and median), 2, 3, 7 (subbasal and median) and cell.

Male genitalia (fig. 5).— Uncus and gnathos as in *C. semperi*; rasp-like processes of gnathos connected by narrow band, narrower than the processes. Valva with cucullus curving inwards and upwards, apex sharply pointed, distal edge finely and irregularly serrate. Aedeagus with serrate process on the left side. See also figures in Chiba et al. (1991).

Distribution.— Only known from Luzon and Marinduque.

Note.— In the original description the length of the forewing is recorded as 15 mm, and the name of the species apparently derives from this small size. The material examined is larger, but since it agrees so well with the original description in all other characters, we are convinced that it belongs to the same species.

### *Coladenia similis* spec. nov.

*Tapena laxmi*; Semper, 1892: 316 (p.p.).

*Coladenia semperi*; Chiba et al., 1991: 59.

Material.— Holotype, ♂, Marinduque, Binunga, 27.ix.1991 (CGT). Paratypes: 1 ♀, as holotype, but 20.v.1987; 1 ♀, C. Luzon, Angat Dam, 25.iv.1988 (all CGT); 1 ♂, C. Luzon, Angat Dam, 28.iv.1988; 1 ♀, N. Luzon, 16 km W of Baguio, 14.ix.1966 (all RMNH); 1 ♂, 1 ♀, Luzon; 1 ♂, SE Mindanao; 1 ♂, Camiguin de Mindanao (all SMF; identified as *Tapena laxmi* by Semper, 1892).

As stated under *C. semperi*, four of the five specimens of *Tapena laxmi* of Semper (1892) belong to this yet undescribed species. The fifth specimen was described as *Coladenia semperi* by Elwes & Edwards (1897). It is ironical that Chiba et al. (1991) depicted the undescribed species under the name of *C. semperi*. Externally *C. similis* is very similar to *C. palawana*, but the male genitalia are quite different.

External characters (fig. 13).— Length of forewing 15.6-18.6 mm. Upperside of forewing brown with pale ochreous superscaling except in a darker median band in which the hyaline spots in space 1b (if present) and spaces 6-8 are situated. Hyaline spots pale yellow or dirty white, in spaces 2, 3, 6-8, 11 and cell, variable in extent, sometimes rather contiguous, but always separate; one or two tiny hyaline dots may be present in space 1b; spot in space 7 almost directly under spot in space 8, spot in space 6 closer to termen; subdorsal dark spot in space 1b small but well visible; cilia unicoloured dark brown. Upperside of hindwing with pale ochreous superscaling; two dark bands that gradually converge and unite in space 7; a dark line of equal width along termen. Underside of forewing as upperside, but darker due to absence of pale superscaling; submarginal area paler. Underside of hindwing dark brown, bands broken into spots; also conspicuous dark subbasal spot in space 7. Termen of forewing hardly excavate in space 1b; termen of hindwing slightly excavate in spaces 1c, 4-5 and 7, giving the wing a wavy outline.

Male genitalia fig. 6).— Uncus triangular. Gnathos ventrally with two, rasp-like processes. Valva with cucullus elongate, broadly rounded distally, dorsal edge finely serrate and with a triangular elevation close to costa; costa slightly concave, distally more or less angular. Aedeagus with serrate process on left side.

Distribution — Luzon, Marinduque, Camiguin de Mindanao, Mindanao.

### *Coladenia palawana* (Staudinger, 1889)

*Plesioneura atilia palawana* Staudinger, 1889: 157. *Netrocoryne atilia* Mabilie, 1888, is now considered a synonym of *Coladenia kehelatha* (Hewitson, 1878).

*Tapena laxmi* (de Nicéville, 1888); Semper, 1892: 316. The material on which Semper based the synonymy actually did not contain *C. palawana*, but consisted of two other species, see under *C. semperi*.

*Coladenia laxmi*; Elwes & Edwards, 1897: 128. These authors simply adopted Semper's synonymy. In doing so, they mixed up three species under the name of *C. laxmi*; see also under *C. semperi*.

*Coladenia palawana*; Swinhoe, 1913: 71; Evans, 1932: 342; 1949:116; Fleming, 1975: 60; Eliot, 1978: 358; Maruyama, 1991: 15.

Material.— 1 ♂, Perak (BM(NH)); 1 ♂, Sumatra (RMNH); 2 ♀♀, Sumatra (BM(NH)); 1 ♂, Palawan (holotype; ZMB).

External characters.— Length of forewing 14.6-16 mm. Very similar to *C. similis*. On the upperside and underside of the forewing the only differences found are the shape of the hyaline spot in space 3: narrowing from vein 3 to vein 2 and rounded at lower edge in *C. palawana*, more squarish and of about equal width in *C. similis*; the hyaline spots in spaces 6-8 (especially 8): rounded in *C. palawana*, more rectangular in *C. similis*; and the colour of the cilia in space 1b: slightly paler than rest of cilia in *C. palawana*, of the same colour throughout in *C. similis*. On the upperside of the hindwing the dark bands are less smoothly curved, more angular, due to the dark spots

in spaces 4-5 being placed a bit closer to the dark spot in the cell; as a consequence the bands converge more abruptly in *C. palawana*; dark terminal line indistinct, but widened and distinct in spaces 5-7. The excavations of the termen in space 1b of the forewing and in spaces 4-5 of the hindwing are distinctly stronger than in *C. similis*, so that the hindwing appears lobed at vein 3.

Male genitalia (fig. 7).— Uncus very different from the uncus of all other *Coladenia* species, squarish, about as broad as tegumen, and with flat apex. Valva, cucullus more or less circular, dorsally curved and extended into serrate sharp point; costa slightly concave, upturned to blunt point at distal end. Relatively small serrate process on left side of aedeagus.

Distribution (based on material examined and Maruyama, 1991).— Perak, Sumatra, Bali, Borneo, Palawan. Maruyama (1991) also records the species from the Philippines in general. It is not impossible that this refers to *C. similis*.

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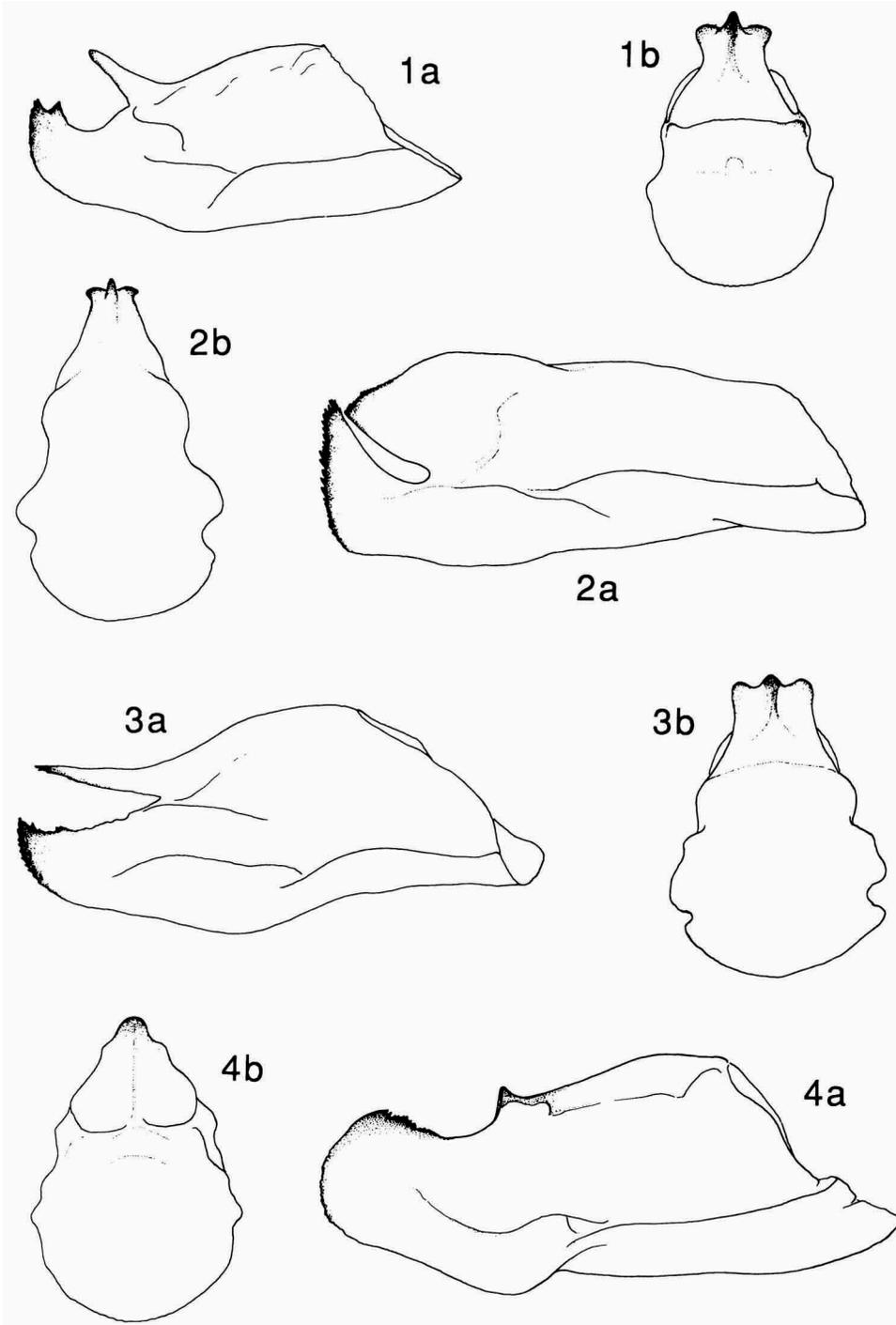
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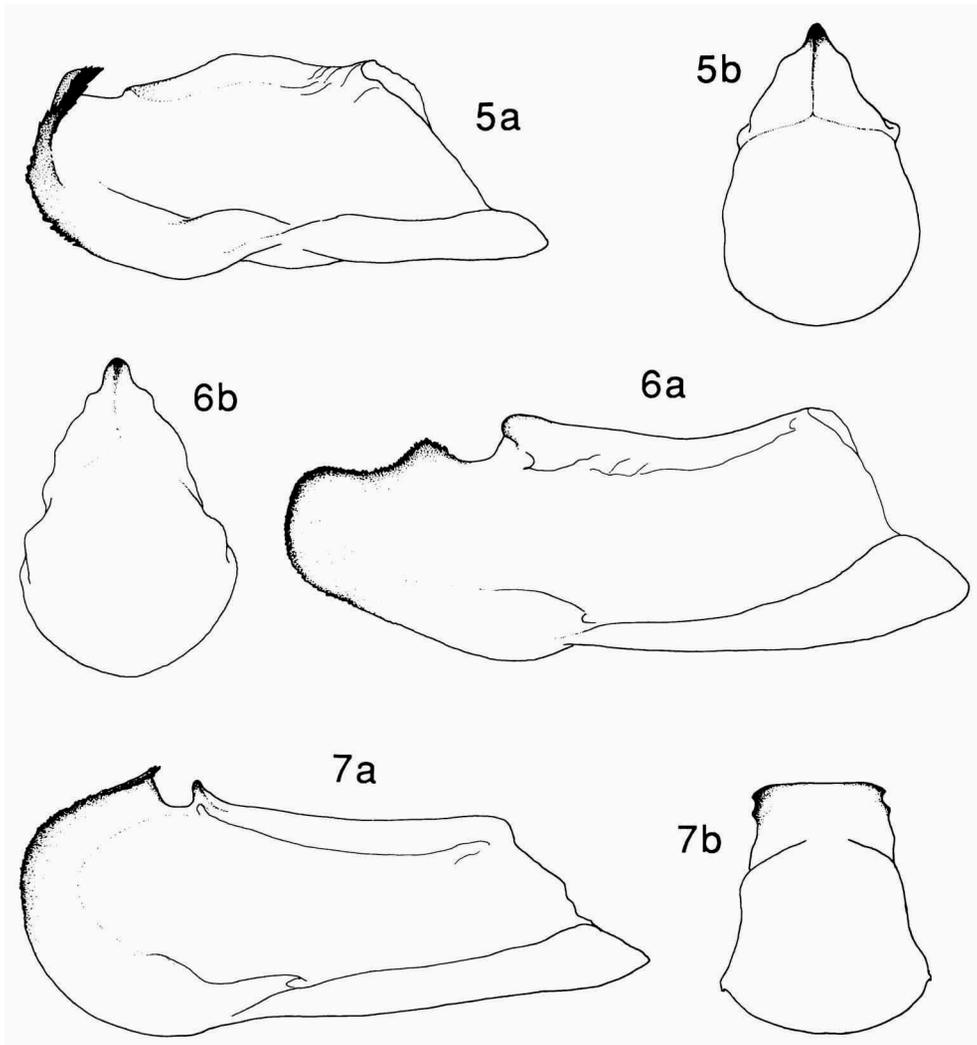
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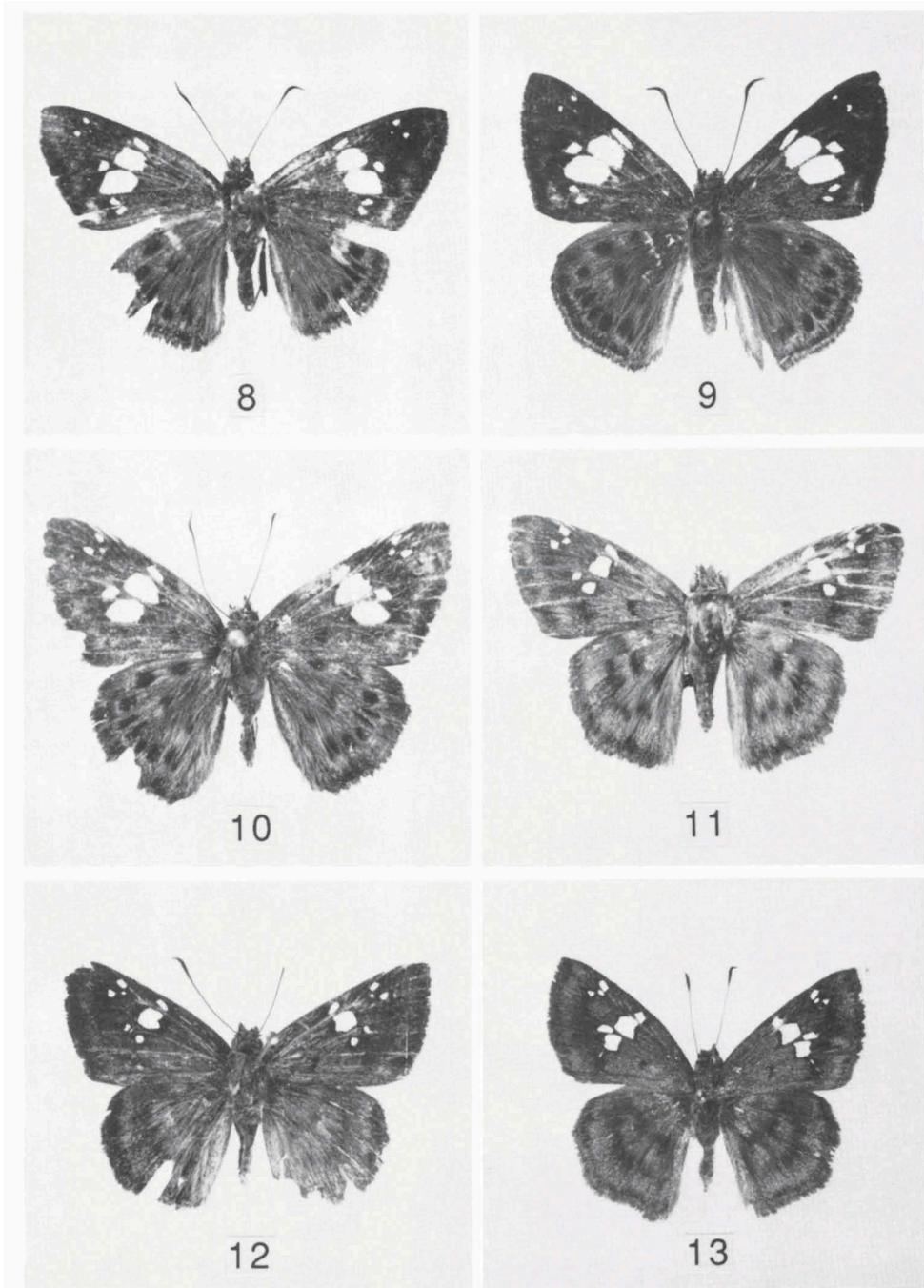
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Figs. 1-4. Inside of left valva (a) and dorsal view of tegumen and uncus (b) of *Coladenia* species. 1, *C. igna igna* (Semper, 1892), Samar; 2, *C. agni sundaе* subsp. nov., Sumatra; 3, *C. ochracea* spec. nov., Leyte; 4, *C. semperi* Elwes & Edwards, 1897, Leyte.



Figs. 5-7. Inside of left valva (a) and dorsal view of tegumen and uncus (b) of *Coladenia* species. 5, *C. minor* Chiba et al., 1991, Luzon; 6, *C. similis* spec. nov., Luzon; 7, *C. palawana* (Staudinger, 1889), Sumatra.



Figs. 8-13. Upperside of *Coladenia* species. 8, *C. igna igna* (Semper, 1892), holotype; 9, *C. igna marinda* subsp. nov., holotype; 10, *C. ochracea* spec. nov., holotype; 11, *C. semperi* Elwes & Edwards, 1897, holotype; 12, *C. minor* Chiba et al., 1991, Luzon; 13, *C. similis* spec. nov., holotype.