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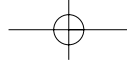
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Description of two new species of *Dirphia* Hübner, [1819] with notes on *Dirphia crassifurca* Lemaire, 1971 and *Dirphia horca* Dognin, 1894 (Lepidoptera: Saturniidae)

L. Racheli & T. Racheli

Abstract

Two new species, *Dirphia inexpectata* Racheli & Racheli, sp. n., from Peru and *Dirphia napoensis* Racheli & Racheli, sp. n., from Ecuador, are described and figured. Some comments on both *Dirphia crassifurca* Lemaire, 1971 and *Dirphia horca* Dognin, 1894 are also given.

KEY WORDS: Lepidoptera, Saturniidae, *Dirphia inexpectata*, *Dirphia napoensis*, new species, Peru, Ecuador.

Descripción de dos nuevas especies de *Dirphia* Hübner, [1819] con notas sobre *Dirphia crassifurca* Lemaire, 1971 y *Dirphia horca* Dognin, 1894 (Lepidoptera: Saturniidae)

Resumen

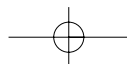
Se describen dos especies nuevas de Perú *Dirphia inexpectata* Racheli & Racheli, sp. n., y de Ecuador *Dirphia napoensis* Racheli & Racheli, sp. n. También se dan algunos comentarios sobre *Dirphia crassifurca* Lemaire, 1971 y *Dirphia horca* Dognin, 1894.

PALABRAS CLAVE: Lepidoptera, Saturniidae, *Dirphia inexpectata*, *Dirphia napoensis*, nuevas especies, Perú, Ecuador.

Introduction

In this paper, two new species of *Dirphia* Hübner, [1819] from Ecuador and Peru are described. These new species belong to the *tarquinia* species-group (*sensu* LEMAIRE, 2002) and properly they are allied to *Dirphia crassifurca* and *Dirphia horca*.

In his revision of Hemileucinae, LEMAIRE (2002) proposed an arrangement of *Dirphia crassifurca* and *Dirphia horca* which reveals some problems regarding the identification of both species. Particularly, main problems rise on the identification of Colombian and Ecuadorian populations which have been only tentatively assigned to *Dirphia crassifurca*. In support of his arrangement and in absence of differences in male genitalia, LEMAIRE (2002) selected two diagnostic characters of the external pattern for the identification of *Dirphia horca* and he restricted the range of this latter species to northern Peru only. On the contrary, the characters outlined by LEMAIRE (2002) are diagnostic to the identification of *Dirphia horca* (if compared to *crassifurca* from Venezuela) but not to separate specimens from northern Peru from those of Ecuador. A new arrangement for *Dirphia crassifurca* and *Dirphia horca* is given also in the light of the two new species herein described.



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***Dirphia inexpectata* Racheli & Racheli, sp. n.**

Holotype male (Fig. 1): Peru, Amazonas, Rodriguez de Mendoza, 1500 m, VIII-IX. 2003, B. Calderon leg., in coll. L. Racheli. The holotype will be deposited in the Zoological Museum, Rome.

Description: Forewing length, 35 mm. Head brown. Antennae yellow. Thorax upperside brown; underside brownish-orange. Abdomen upperside brown-black, underside brownish-orange. Legs reddish-orange. In the forewing, marginal, submarginal and basal areas whitish with an irregular brown spot near the apex. A further brown spot is present in the submarginal area between CuA1 and CuA2. A white line separates the submarginal and the post-discal areas. The discal area is entirely brown with a white Y-shaped discal spot. The lower branch of the discal spot extends from the submarginal line to the basal area. A yellow streak is present in the upper branch of the Y-shaped discal spot. The hindwing is entirely orange with a black submarginal line from the costa to the inner margin. A black Y-shaped spot is present in the cell extending into the black submarginal line. Black scales are present in the submarginal area. The ground colour of the underside is brownish-orange on both wings.

Genitalia: The genitalia of the holotype are similar to those of *crassifurca*, *horca* and *centralis* and properly they show shared features with all these taxa (see Lemaire 2002: figs. 93-94 for comparisons). The uncus is rounded similar to that of *centralis* and, in lateral view, bent medially with a blunt apex. Both apical and inner parts of the harpe heavily sclerotized as in *crassifurca*. The saccus is wide and rounded ventrally, not pointed like in *crassifurca* and more similar to that of *horcana* Schaus, 1911. The shape of the gnathos is very similar to that of *horca* but with lateral projections, smooth and slightly rounded apically like that of *centralis*. The cornutus of vesica is similar to that of *crassifurca*.

Female unknown. Two females from the same locality of the holotype of *Dirphia inexpectata* have been examined but they show the same wing patterns of females of *Dirphia horca* from Ecuador. For this reason, these females have not been included in the type-series.

Derivatio nominis: From Latin, *inexpectatus* / a = unexpected.

Comments. The ground colour and the white Y-shaped discal spot of the forewing are obviously representative characters of the *Dirphia tarquinia* species-group (*sensu* LEMAIRE, 2002). The black Y-shaped spot in the hindwing looks similar to that of the recently rediscovered *Dirphia centralis* Johnson & Michener, 1948 from central Peru (VAN SCHAYCK, 2000; LEMAIRE, 2002). But, the shape of the wings, the ground colour and the small size of this new species suggest that it is also related to *Dirphia horca*. However, some basic differences can be recognized comparing the holotype of *inexpectata* with male specimens of *centralis*. In all the males of *centralis* examined, the shape of the white Y-discal spot of the forewing is different from that of *inexpectata*. The presence of a black streak in the upper branch of the white Y-discal spot of the forewings characterizes *centralis* whereas in *inexpectata* the streak is yellow and very similar to that of *horca*. The submarginal area of the forewing of *centralis* shows a variable series of irregular greyish-white designs not found in *inexpectata*. In the hindwings, the shape of the black Y-shaped spot is more evident in *inexpectata* and it runs up to the submarginal black line. The shape of the upper and lower branches of the black Y-shaped spot are always of the same length and width while in *centralis* the upper branch is more evident than the lower one. Furthermore, the black Y-shaped spot of *centralis* does not extend to the submarginal line. On the underside of the forewings, the ground orange-brownish colour of *inexpectata* is uniform but that of *centralis* is lighter along the inner margin. The presence of black spots in the discal cells of both wings has been recognized in *centralis* but not in *inexpectata*. Further, the greyish line of the hindwings from the costa to the margin of *centralis* is not present in *inexpectata*.

***Dirphia napoensis* Racheli & Racheli, sp. n.**

Holotype female (Fig. 2): Ecuador, Napo, Cordillera de Huacamayo, S. Elena, 1800 m., 22-X / 5-XI-1993; L. & T. Racheli leg. Paratype: 1 male, same data as the holotype. The holotype will be deposited in the Zoological Museum, Rome.

Description: Forewing length, 44 mm. Head brown. Antennae yellow. Thorax upperside brown;

underside brownish-orange. Abdomen upperside dorsally orange and ringed with black; underside brownish-orange. Legs brownish-orange. The ground colour of the upperside forewing is brown with submarginal and basal areas whitish-grey. The margin is brownish. A white line separates the submarginal and the post-discal areas. The discal area is entirely brown with a white Y-shaped discal spot. The hindwing is entirely orange with an indistinct grey line from the costa to the inner margin and it separates the submarginal area from the post-discal area. The submarginal area is basically orange but with an evident grey suffusion. The margin is brown. The ground colour of the underside is brownish-orange on both wings. On the forewing, a whitish line separates the submarginal from the post-discal areas and the white Y-shaped discal spot is well-marked. On the hindwing, a grey line separates the submarginal area from the post-discal area. The brownish-orange margin is darker than the ground colour.

Paratype, male: Forewing length: 35 mm. Very similar to *Dirphia crassifurca* (forewing length: 39-40 mm) but smaller. Comparing *Dirphia napoensis* with *Dirphia crassifurca*, differences in the length of the upper and lower branches of the Y-shaped discal spot and the presence of a marked black line in the cell of the hindwing are probably not diagnostic. However, the forewing is more pronounced than in *crassifurca*. On the underside, the orange ground colour is very similar to that of *crassifurca* but *napoensis* shows a marked black costa which is usually very reduced in *crassifurca*.

Derivatio nomis: The name refers to the Napo province in Ecuador where the holotype has been collected.

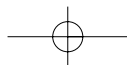
Comments. The female of *Dirphia napoensis* sp. nov. has been compared with the allotype of *Dirphia crassifurca* figured by LEMAIRE (2002: pl. 89, fig. 10) and with other females of the same species all from Venezuela (La Azulita). The new species is smaller than *crassifurca* but it mainly differs for having the forewings and the hindwings more elongated if compared with *crassifurca*, and for the apex of the both wings more pronounced. Although the ground colour is similar, the tonality of the colour is less marked in *napoensis* than in *crassifurca*. For this reason, the veins of *napoensis* are evident while in the females of *crassifurca* they are less marked. Diagnostic is also the shape of the white Y discal spot which looks more similar to that of *Dirphia aculea* Vuillot, 1892 and *Dirphia subhorca* Dognin, 1901 than to that of *crassifurca*. However, comparisons with *Dirphia aculea* and *Dirphia subhorca* confirm that *napoensis* differs from both. Finally, *Dirphia napoensis* has been compared also with *Dirphia horca* and they differ in several characters of the habitus (i.e., colour of the legs and abdomen, ground colour of both wings, shape of the Y discal spot).

Discussion

Dirphia crassifurca and *Dirphia horca*: The Lemaire's (2002) arrangement

Dirphia crassifurca has been described by LEMAIRE (1971) from Venezuela (Merida) and it has been subsequently reported also from Ecuador by LEMAIRE & VENEDICTOFF (1989). More recently, LEMAIRE (2002) stressed that the typical population from Venezuela differs from those recorded from eastern Colombia and eastern Ecuador. According to this author, the problem is that these populations from Colombia and Ecuador are morphologically very similar to *Dirphia horca*. The validity of this latter species has been confirmed by LEMAIRE (2002) on the basis of recent specimens from northern Peru (San Martín department). These peruvian specimens strictly refer to the type specimen of *D. horca*. DOGNIN (1894) described *D. horca* based on a single male from Zamora [Ecuador]. Although we have not examined the type of this species, LEMAIRE (2002) has considered the specimen later figured by DOGNIN (1896) as *D. horca*. Since this species has been described on a single specimen, the figured specimen (DOGNIN, 1896: pl. XII, fig. 15) is likely to be the holotype.

Because there are no differences in the male genitalia, LEMAIRE (2002: 794) argued that *horca* differs from *crassifurca* for two main characters of the Y-shaped discal spot in the forewing. These characters are the presence of a yellow stria in the upper branch of the Y-shaped discal spot and the presence of a yellow line in the lower branch at the intersection to the antimedial line. Obviously these two characters are present in the male specimen figured by LEMAIRE (2002). It must be noticed that the



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first character is not recognizable in the specimen figured by DOGNIN (1896: pl. XII, fig. 15) whereas the second is clearly absent because the lower branch of the Y-shaped discal spot does not extend as far as the antimedial line. Finally, the opinion of LEMAIRE (2002) is that the range of *horca* is restricted to northern Peru (and possibly to Zamora area) while the populations from eastern Colombia and from eastern Ecuador must be considered a possibly undescribed subspecies of *crassifurca*.

On the identification of Colombian and Ecuadorian specimens

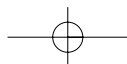
After the publication of LEMAIRE's (2002) revision of Hemileucinae, all the available specimens of "*Dirphia crassifurca*" from Ecuador have been examined according to this arrangement. All these specimens should be referred to an undescribed subspecies of *Dirphia crassifurca*. On a total of 19 males examined from Napo province, all they show the yellow streak in the upper branch of the Y-shaped discal spot which is one of the two diagnostic characters for the identification of *D. horca*. This character has been recognized also in specimens from Azuay and Zamora Chinchipe provinces (Ecuador) as well as from those recorded in Puno department (southern Peru).

The second character outlined by LEMAIRE (2002) for *D. horca* is conditioned by the length of the lower branch of the Y-shaped discal spot. As shown above, the male specimen figured by LEMAIRE (2002: pl. 82, fig. 7) from northern Peru shows the lower branch extending to the antimedial line and the presence of a yellow stria. This character has been detected only in some of the Ecuadorian specimens (from Napo province) examined because not in each specimen the lower branch is extending to the antimedial line. However, this latter trait is present also in male specimens from Puno department (southern Peru) as well as in those from Azuay and Zamora Chinchipe provinces (Ecuador). Thus, the presence of the yellow stria has been recorded in all the peruvian specimens and in some of Ecuadorian specimens examined.

Assuming the validity of this second character outlined by LEMAIRE (2002), it must be underlined that the lengths of the upper branch and lower branch of the Y-shaped discal spot are very variable among and within all the species of the *tarquinia* species-group. The variability of this character among specimens from Napo province suggests that this trait is not so diagnostic in order to separate Ecuadorian from peruvian specimens. Excluding this feature, no other substantial difference has been evidenced among specimens from Napo, Zamora-Chinchipe and Azuay provinces (Ecuador) or from San Martn and Puno departments (Peru). Although LEMAIRE (2002) stated that only the population from San Martn department (Peru) must be assigned to *D. horca*, his arrangement is not supported by evidence. For this reason, the specimens from Napo, Azuay, and Zamora Chinchipe provinces (Ecuador) and those from San Martn and Puno departments (Peru) are here all assigned to *Dirphia horca*. Finally, only in the light of the present arrangement, the two characters outlined by LEMAIRE (2002) are diagnostic to separate *Dirphia horca* from the *crassifurca* subgroup (i.e., *crassifurca*, *napoensis* and the Colombian specimens from Santander dept., see below). Objectively, the present arrangement is also indirectly supported by the description of *Dirphia napoensis* sp. nov. which is more related to *D. crassifurca* than to *D. horca*. Thus, both lineages (i.e., *crassifurca* and *horca*) are sympatric in the Napo province, Ecuador.

With the present arrangement, the old records of *Dirphia horca* from Chanchamayo (Peru) listed by BOUVIER (1930) should likely be related to *Dirphia horca* whereas those by LEMAIRE (2002) tentatively identified as an undescribed subspecies of *Dirphia crassifurca* from Ecuador should be probably assigned to *Dirphia horca*. According to this new arrangement, the range of *Dirphia horca* extends from Ecuador to Peru on the eastern side of the Andes. Furthermore, only minor differences have been noticed in the habitus of the Ecuadorian and peruvian male specimens of *Dirphia horca* (e.g. those from Ecuador are smaller) but only further investigation will confirm if both groups of populations refer to a single taxonomic unit. No specimens from Bolivia have been examined but *Dirphia horca* should be recorded also for this country.

We noticed that LEMAIRE's (2002) records of *crassifurca* from Colombia have been based on specimens collected by K. Wolfe and colleagues. Kirby Wolfe kindly sent photos of two pairs from Co-



lombia collected in two different sites located in Caldas and Santander departments which have been identified by Lemaire as *D. crassifurca* (C. Lemaire *in litt.* to K. Wolfe). It is our opinion that also these two pairs refer to two further different species. The pair from Santander department is related to *crassifurca* but the female is different from those of *crassifurca* and *napoensis* and more similar to the female of *Dirphia ludmillae* figured by LEMAIRE (2002: pl. 90 fig. 4). The other pair from Caldas department is possibly a different species but not so much related to *crassifurca* and *napoensis*. Among other differences, this latter pair shows a completely black abdomen which is an unusual feature noticed also by LEMAIRE (2002).

Concluding, *Dirphia crassifurca*, *Dirphia napoensis* and also the population from Santander department, Colombia, form a subgroup while *Dirphia horca* and *Dirphia inexpectata* refer to another subgroup within the major species-group of *Dirphia tarquinia*.

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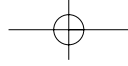
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