

An abdominal scent organ in some female Pyrginae (Lepidoptera, Hesperii- dae)

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For some obscure reason much less attention has been paid to the female than to the male genitalia in butterflies. This has led to the oblivion of characters, that not only are useful for identification but also may have a large bearing on phylogenetic considerations. Other abdominal structures, even close to the genitalia, have attracted still less attention. This is illustrated by the subject of the present paper.

The male genitalia of all species of the wideranging genus *Erynnis* Schrank have been studied and illustrated more than once (e.g. Godman & Salvin, 1879-1901; Hayward, 1948; Evans, 1949, 1953), but the abdominal scent organ found in the females of the common palaeartic species *E. tages* (L.) and many other species and described more than 60 years ago by Reverdin (1914), was further only mentioned by Burns (1964). Moreover, Reverdin detected the organ by accident, as he intended to study the male genitalia, but mistook a female for a male specimen. The aim of the present paper is to draw attention again to this scent organ, to give some new information and to discuss some taxonomic and phylogenetic implications.

The scent organ concerned is located at the tergite of the seventh abdominal segment and occupies its anterior portion. It is not visible in resting or dead specimens, unless upon dissection, as it is totally covered by the tergite of the sixth segment, but Burns (1964) describes how a female of *Erynnis propertius* (Scudder et Burgess) exposed the organ during courtship. This observation is the main reason for speaking of a scent organ, apart from the fact that abdominal scent organs are by no means rare in Lepidoptera (see, e.g., Urbahn, 1913). A histological study is needed to make sure that the organ has at least something to do with secretion.

The organ is composed of numerous large, relatively nondeciduous scales, inserted in a rather membranous, anterior portion of the seventh abdominal tergite. The scales vary much in length according to the species, as do the shape and extension of the field of scales, see fig. 1-5. As the wall bearing the scales is rather membranous, the organ may seem to be intersegmental, between the sixth and seventh segments, but usually the distinction between the intersegmental membrane and the anterior portion of the seventh tergite is easily observed. The most striking development was found in *Ephyriades arcas philemon* (F.), where the whole field of scales has sunk into a pouch with a relatively small opening to the outside (fig. 3). The species examined so far are listed in table 1 (except the species of the *Pyrgus* group, see below).

The genus *Erynnis* and allies are known for the asymmetry of the male genitalia of many species. Reverdin (1914) was struck by the correlation between this asymmetry and the presence of the female scent organ, as he found the scent organ only in species with asymmetric male genitalia. He examined, however, only one species with symmetric male genitalia, so his idea of correlation was rather premature. As can be seen from table 1, there are four exceptions to this "correlation" in the species examined up to now. However, there may be an indirect correlation between the asymmetry of the male genitalia and the place of the female scent organ. In part of the species examined not only the male, but also the female genitalia are asymmetric and in such cases the scent organ is not situated centrally on the dorsum. Clear examples are *Ephyriades arcas philemon* (F.) (fig. 3), in which the pouch of the scent organ is to the left of the dorsal rim of the tergite, i.e. to the same side as the strongest development of the genitalia; and *Gorgythion begga pyralina* (Möschler) (fig. 4), in which the female genitalia are strongly developed at the right side of the abdomen (largely invisible in the figure) and the scent organ is composed of two separate fields of scales, one dorsally and the other laterally at the right side (marked as a dark blotch in the figure).

species examined	abdominal scent organ in female present (×) or absent (—)	male genitalia symmetric (s) or asymmetric (a)	examined by ¹⁾
<i>Achlyodes busirus</i>	—	a	J
<i>thraso</i>	—	s	R
<i>Grais stigmaticus</i>	—	s	J
<i>Timochares trifasciata</i>	×	a	B
<i>Anastrus sempiternus</i>	×	s	J
<i>ulpianus</i>	—	s	J
<i>Ebrietas anacreon</i>	×	a	B
<i>Cycloglypha tisas</i>	—	a	J
<i>Helias phalaenoides</i>	×	a	J
<i>Chiomara asychis</i>	×	a	B, J, R
<i>Gesta gesta</i>	×	a	B, R
<i>Ephyriades arcas</i>	×	a	J
<i>Erynnis tages</i>	×	a	B, J, R
<i>pelias</i>	×	a	B
<i>marloyi</i>	×	a	B
<i>montanus</i>	×	a	B
<i>icelus</i>	×	a	B, R
<i>brizo</i>	×	a	B, R
<i>juvenalis</i>	×	a	B, R
<i>telemachus</i>	×	a	B
<i>propertius</i>	×	a	B, R
<i>meridianus</i>	×	a	B
<i>scudderi</i>	×	a	B
<i>horatius</i>	×	a	B, R
<i>tristis</i>	×	a	B, R
<i>martialis</i>	×	a	B, R
<i>pacuvius</i>	×	a	B, R
<i>zarucco</i>	×	a	B, R
<i>funeralis</i>	×	a	B, R
<i>lucilius</i>	×	a	B
<i>baptisiae</i>	×	a	B
<i>afranius</i>	×	a	B, R
<i>persius</i>	×	a	B, R
<i>Gorgythion begga</i>	×	a	J
<i>Staphylus mazans</i>	×	s	J
<i>Carrhenes canescens</i>	—	s	J
<i>Quadrus cerealis</i>	—	s	J

Table 1. List of species of HesperIIDae examined with regard to the presence or absence of an abdominal scent organ in the female

¹⁾ B = Burns (1964), J = R. de Jong, R = Reverdin (1914)

All species examined belong to the subfamily Pyrginae. This subfamily was divided by Evans (1949, 1953) into a number of genus groups which are not always clearly defined. A major source of indistinctness is the position of the *Erynnis* group which was erected by Evans (1953) to receive 16 genera of largely Neotropical HesperIIDae. Only in the genus *Erynnis* there are species that do not occur in the Neotropical Region and four species of this genus are confined to the Palearctic Region. The Palearctic species were placed by Evans (1949) in the *Pyrgus* group, which differs from the Palaeo-

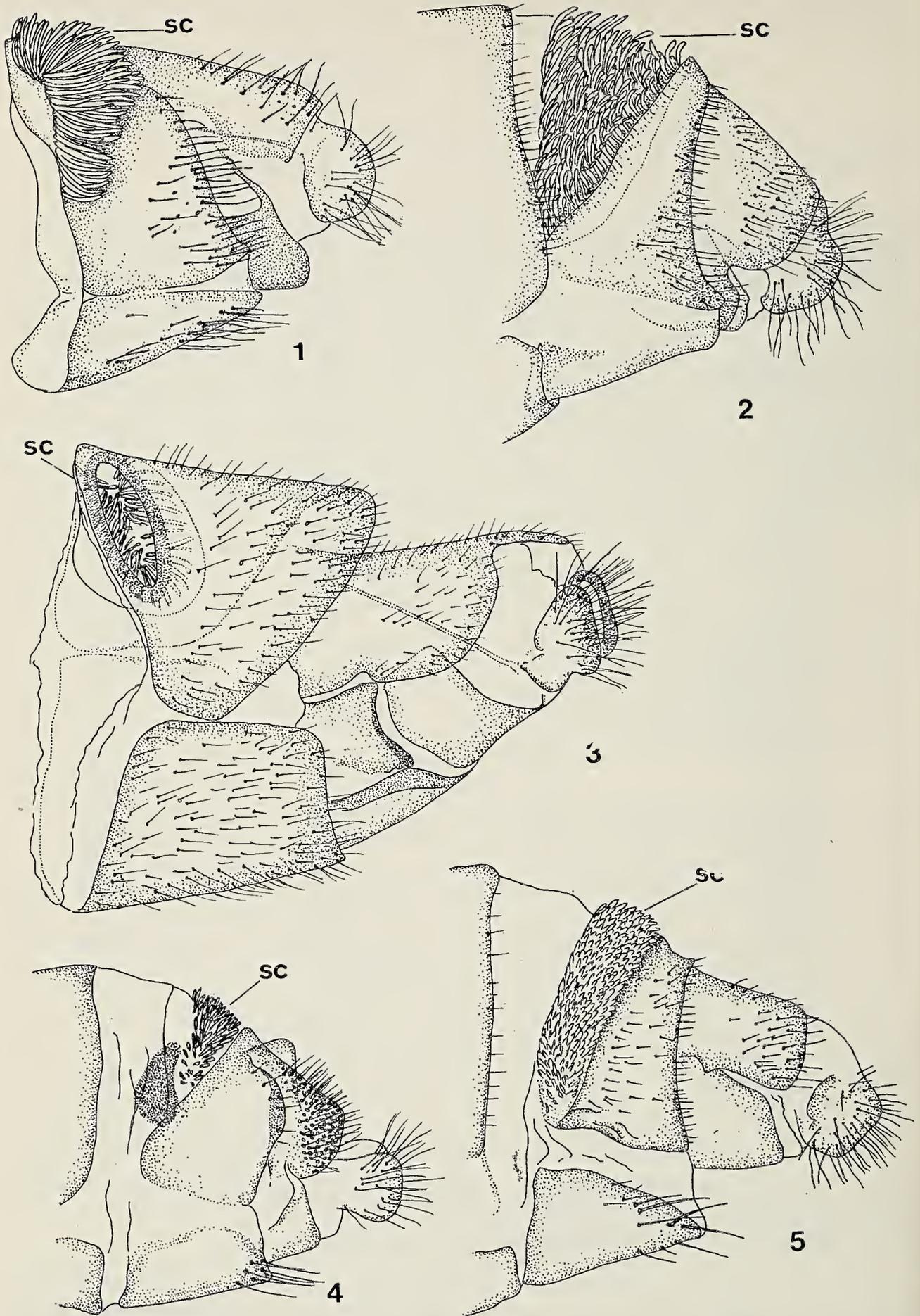


Fig. 1-5. Abdominal scent organ (sc) in female Hesperiiidae. Tip of abdomen seen from the left. 1, *Helias phalaenoides phalaenoides* (F.). 2, *Chiomara asychis* (Stoll). 3, *Ephyriades arcas philemon* (F.). 4, *Gorgythion begga pyralina* (Möschler). 5, *Erynnis tages* (L.).

tropical *Tagiades* group mainly in the position of vein 5 of the hind wing. This vein is oblique in the *Tagiades* group, nearer to vein 4 at the termen and to vein 6 at its origin, while it is central between veins 4 and 6 in the *Pyrgus* group (including the Palaearctic *Erynnis* species). In 1953, however, Evans described vein 5 of the hind wing as generally oblique in the newly erected *Erynnis* group. Thus in this character the *Erynnis* group agrees with the *Telemiades* group which Evans considered the New World representative of the *Tagiades* group. There are more inconsistencies, which without previous knowledge make it usually impossible to classify a species as belonging to either the *Telemiades* or the *Erynnis* group. Therefore, the distinction of a *Telemiades* and an *Erynnis* group has no practical value and on phylogenetic grounds it is at least disputable. Even if they constitute two evolutionary lines (what cannot be concluded from the data given by Evans), the distribution of the genera over the two groups seems to need a thorough re-examination.

Turning again to the female scent organ the question arises how far this character can be used in a phylogenetic classification of the Pyrginae. All species listed in table 1 are placed by Evans in the *Erynnis* group, except the last four which are members of the *Telemiades* group. This could be a further argument for a rearrangement of the genera or even a fusion of the two groups, as it is very unlikely that such an intricate character arose more than once during the evolution of the Pyrginae, and as it is not (yet) known in other genus groups (I examined the female genitalia of most species of the *Pyrgus* group; in other groups much work has yet to be done). There is, however, some reason for caution. In the male Pyrginae scent organs are far from being rare. The most usual types are a costal fold at the fore wing enclosing specialized scales and a metatibial hair tuft fitting into a metathoracic pouch. The distribution of these characters over the species of the Pyrginae suggests that they can easily be lost, so that within a genus some species have and others lack one of these (or both) characters. Thus, although the presence of these characters may indicate a close relationship, their absence does not indicate the reverse. The female scent organ may have a comparable scattered distribution and the use of this character in the phylogeny of the Pyrginae needs much care. In other words, before we can unite the *Telemiades* and *Erynnis* groups on the ground of the common presence of the female scent organ described above, we have to make acceptable that this character is an autapomorphy of both groups and that its absence in other groups is not due to loss. Much work still needs to be done in this respect, especially on New World species. Apart from this, other characters (e.g. wing venation) have to be checked and tested for their usefulness for phylogenetic considerations. For the time being, the separation of the *Telemiades* and *Erynnis* groups seems poorly justified.

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