

A new species of *Hedychridium* Abeille de Perrin, 1878 from Kazakhstan (Hymenoptera: Chrysididae)

Новый вид рода *Hedychridium* Abeille de Perrin, 1878 из Казахстана (Hymenoptera: Chrysididae)

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A new species, *Hedychridium alatum* sp. nov., from South East Kazakhstan is described. The previously named *H. sericifrons* species group is here renamed in *H. flos* species group. Cases of body discoloration in desert-dwelling species are reported.

Описывается новый вид *Hedychridium alatum* sp. nov. из Юго-Восточного Казахстана. Прежнее название видовой группы (группа *H. sericifrons*) заменено на новое (группа *H. flos*). Сообщается о случаях обесцвечивания тела у обитающих в пустыне видов.

Key words: cuckoo wasps, taxonomy, Kazakhstan, Chrysididae, *Hedychridium*, new species, new name of species group

Ключевые слова: осы-блестянки, таксономия, Казахстан, Chrysididae, *Hedychridium*, новый вид, новое название видовой группы

INTRODUCTION

The genus *Hedychridium* Abeille de Perrin, 1878 is the largest among the tribe Elampini, and the second in the family Chrysididae after *Chrysis* Linnaeus, 1761, including more than 300 valid species (Paukkunen et al., 2015; Rosa et al., 2017b). More than 200 species are known from the Palearctic region, around 90 from Europe, 40 from Russia (Rosa et al., 2017b) and Central Asia (Rosa et al., 2017a), yet the number of Asian species is still underestimated. *Hedychridium* is a heterogeneous genus of small to medium-sized cuckoo wasps (2.0–7.0 mm), distributed particularly in dry to arid areas of the Holarctic region.

Semenov (1954) and Semenov & Nikol'skaya (1954) subdivided the genus *Hedychridium* into twelve genera, namely (besides *Hedychridium*): *Actineuchrum* Semenov, 1954; *Claudiola* Semenov, 1954; *Colpopyga* Semenov, 1954; *Cyrteuchridium* Semenov, 1954; *Cyrteuchrum* Semenov, 1954; *Euchridium* Semenov, 1954; *Euchrum* Semenov,

1954; *Homaleuchrum* Semenov, 1954; *Irenula* Semenov et Nikol'skaya, 1954; *Zarudnidium* Semenov, 1954; *Zarudnium* Semenov, 1954. Currently, only *Colpopyga* Semenov, 1954 is considered as a valid genus (Rosa, 2017). All other Semenov's genera were synonymised with *Hedychridium* and treated as species-groups by Linsenmaier (1968). Kimsey & Bohart (1991) refrained from formally formulating species-groups, because of insufficient knowledge about a number of species, yet discussed some Linsenmaier's species-groups and some other well characterized groups (e.g. *H. attenuatum*, *H. dybowskii*, *H. dimidiatum*, *H. frugale*, *H. margaritaceum*, *H. maculum*, *H. obscuratum*, *H. sericifrons* and *H. sulcatum* species groups).

Following Linsenmaier's (1968) viewpoint and more recent publications (Kimsey & Bohart, 1991; Rosa et al., 2017a), members of *Actineuchrum* should be included in the *H. dybowskii* species group, *Claudiola* in the *H. rhodochlorum* species group, *Cyrteuchridium* in the *H. monochroum* species group, *Cyrteuchrum* in the

H. sericifrons = *H. flos* (see below) species group, *Euchridium* in the *H. ardens* species group, *Euchrum* in the *H. roseum* species group, *Homaleuchrum* in the *H. anale* species group, *Irenula* in the *H. margaritaceum* species group, *Zarudnidium* and *Zarudnium* in the *H. incrassatum* species group.

In the present study, a new species of the *H. flos* species group is described, herewith this name of species group is here introduced as a new name for the former *H. sericifrons* species group of Kimsey & Bohart (1991) (= *Cyrteuchrum* Semenov).

MATERIALS AND METHODS

Specimens were examined and described under a Togonal SCZ stereomicroscope; images were taken with a Nikon D-80 camera connected to the stereomicroscope and stacked with the Combine ZP software. The morphological terminology follows Kimsey & Bohart (1991). The following abbreviations are used in the descriptions: F1, F2, F3 – flagellomeres 1, 2, 3; MOD – mid ocellar diameter; MS – malar space, shortest distance between base of mandible and margin of compound eye; OOL – oculo-ocellar line, shortest distance between lateral ocellus and compound eye; P – pedicel; PD – puncture diameter; POL – shortest distance between posterior ocelli; l/w – ratio of length to width.

The holotype of the new species is deposited at the Zoological Institute of RAS, St Petersburg [ZIN], in the originally separated collection of Kazakh chrysidids collected by V.L. Kazenas.

TAXONOMIC PART

Order **HYMENOPTERA**

Family **CHRYSIDIDAE**

Subfamily **CHRYSIDINAE**

Tribe **ELAMPINI**

Genus *Hedychridium* Abeille de Perrin, 1878

Type species: Hedychrum minutum Lepeletier, 1806 [= *Hedychridium ardens* (Co-

quebert, 1801)] by subsequent designation (Ashmead, 1902).

Remarks. *Hedychridium* is a quite heterogeneous genus, difficult to properly characterize. Species of this genus are mainly characterized by: single perpendicular tooth on the tarsal claws; transverse pronotal carina (Kimsey & Bohart, 1991); posterior margin of the third metasomal tergite evenly rounded, without notches, teeth or angular projections (excluding some taxa having 2–6-toothed third metasomal tergum which were later synonymised with *Hedychridium*, namely *Actineuchrum soloriens* Semenov, 1954 from Central Asia, and African species originally described in the genera *Acrotoma* Mocsáry, 1902, *Buyssonina* Mocsáry, 1902, *Hexachridium* Bischoff, 1913, and *Tetrachridium* Zimmermann, 1953). A few species have metasoma entirely or largely non-metallic red to orange, sometimes with more or less obvious iridescent or metallic reflections.

Hedychridium flos species group

Diagnosis. Members of *H. flos* species group are recognized by more or less sharp, strongly arcuate to angulate, and M-shaped transverse frontal carina (in most part of *Hedychridium* species, it is usually weak to completely obsolete); scapal basin shallow, with tiny punctures and dense appressed silvery setae; malar spaces less than 1 MOD; fore femur ventrally carinate and angulate; propodeal teeth unmodified; metasomal terga 2 and 3 unmodified; punctures on metasoma simple; apical margin of metasomal tergum 3 with translucent rim; tarsomeres unmodified; setae on mesosoma and metasoma dense and long.

Remarks. Kimsey & Bohart (1991) proposed the name *H. sericifrons* (Semenov, 1967) for this species group. However, since *H. flos* (Semenov, 1954) was designated as the type species of the former genus *Cyrteuchrum* by Semenov (1954), it would be more reasonable to select this species name for the name of the former *H. sericifrons* group of species.

Some species, included by Kimsey & Bohart (1991) in the *H. sericifrons* species group, actually belong to the *H. amatum* species group. This group is characterized by: transversal frontal carina faint; brow prominent; metasomal terga 2 and/or 3 carinate; punctures on metasoma large and coarse; propodeal teeth falcate; fore femora ventrally carinate; apical margin of tergum 3 evenly rounded [*H. amatum* Nurse, 1904 (= *H. zimmermanni* Balthasar, 1953) and *H. tyro* (Trautmann, 1926)], or with four [*H. soloriens* (Semenov, 1954)] or six teeth [*H. sexdentatum* du Buysson, 1898 and *H. zavattarii* (Zimmermann, 1952)]. Lastly, *H. smaragdinum* (Semenov, 1954) should be included in the *H. anale* species group characterized by transversal frontal carina faint, fore femora laterally and ventrally carinate as well as with outer surface between these carinae flat, metasomal terga 2 and 3 without medial and transverse sub-apical ridges but usually with a wide semi-transparent rim on apical margin of metasomal tergum 3. This group includes, among others: *H. anale* (Dahlbom, 1854), *H. disunctum* Linsenmaier, 1968 and *H. moricei* du Buysson, 1904.

Species included. *Hedychridium flos* (Semenov, 1954) [= *H. nivifrons* (Semenov, 1967); = *H. redikortzevi* (Semenov, 1967); = *H. lindholmi* (Semenov, 1967)]; *H. garianum* Linsenmaier, 1968; *H. hirtum* (Semenov, 1967); *H. pruinifrons* (Semenov, 1967); *H. semenovi* Kimsey, 1991 [repl. name for *H. semirufum* (Semenov et Nikol'skaya, 1954)]; *H. sericifrons* (Semenov, 1967); *H. xanthum* (Semenov, 1967); *H. znoikoi* (Semenov, 1967). Two Afrotropical species, *H. bidens* Kimsey, 1988 and *H. faciale* (Mocsáry, 1889), have been also included in this group by Kimsey & Bohart (1991), but a further study on their types is necessary after the rearrangement proposed here.

***Hedychridium alatum* sp. nov.**
(Fig. 1A–1F)

Material examined. Holotype; female (head missing), **Kazakhstan** (SE): environs of Dubun,

80 km E of Chilik, 26.VI.1996, leg. V.L. Kazenas [ZIN].

Description. Female. Body length 2.7 mm (supposedly about 3.0 mm with head). Fore wing length 2.2 mm.

Mesosoma. Pronotum with double punctation, with tiny punctures on intervals between medium and large punctures, medially with larger and denser punctures (Fig. 1B); pronotal margin distinctly sinuate, with posterolateral lobes unusual (flattened and dilated), directed backwards (Fig. 1B) and partially covering mesoscutal wing fossa. Mesoscutum with similar double punctation, medially with larger and denser punctures (0.5–1.0 PD apart); notauli complete, not basally widened; parapsidal sulci deep. Mesoscutellum with intervals between large punctures polished, almost devoid of tiny punctation. Mesopleuron ventrally rounded, without omaulus or carina, with large but shallow punctures and polished intervals between them. Metascutellum anteriorly with foveate-reticulate punctures, medially and posteriorly with large irregular foveae. Propodeal teeth triangular, slightly pointing backward (Fig. 1D). Fore wing medial vein almost straight, with no significant features. Forefemur unmodified, not expanded or angulate; hind tarsi unmodified, with second and third tarsomere subequal in length.

Metasoma. Metasomal terga 1 and 2 with minute, shallow, even punctures; punctures 1–3 PD apart, with polished intervals (Fig. 1E); punctation laterally denser. Tergum 3 with irregular, confluent punctures. Terga 2 and 3 with broad, impunctate, translucent rim on posterior margin. All sterna almost impunctate and polished, or partly with only very tiny scattered punctures (Fig. 1D).

Coloration. Mesosoma metallic green; legs with metallic green coxa; trochanter, tibiae and femora non-metallic orange, with opalescent reflection; tarsi yellowish; metasoma non-metallic orange, with weak opalescent purplish reflections.

Vestiture. Body overall covered by whitish, dense and erect setae; these setae long

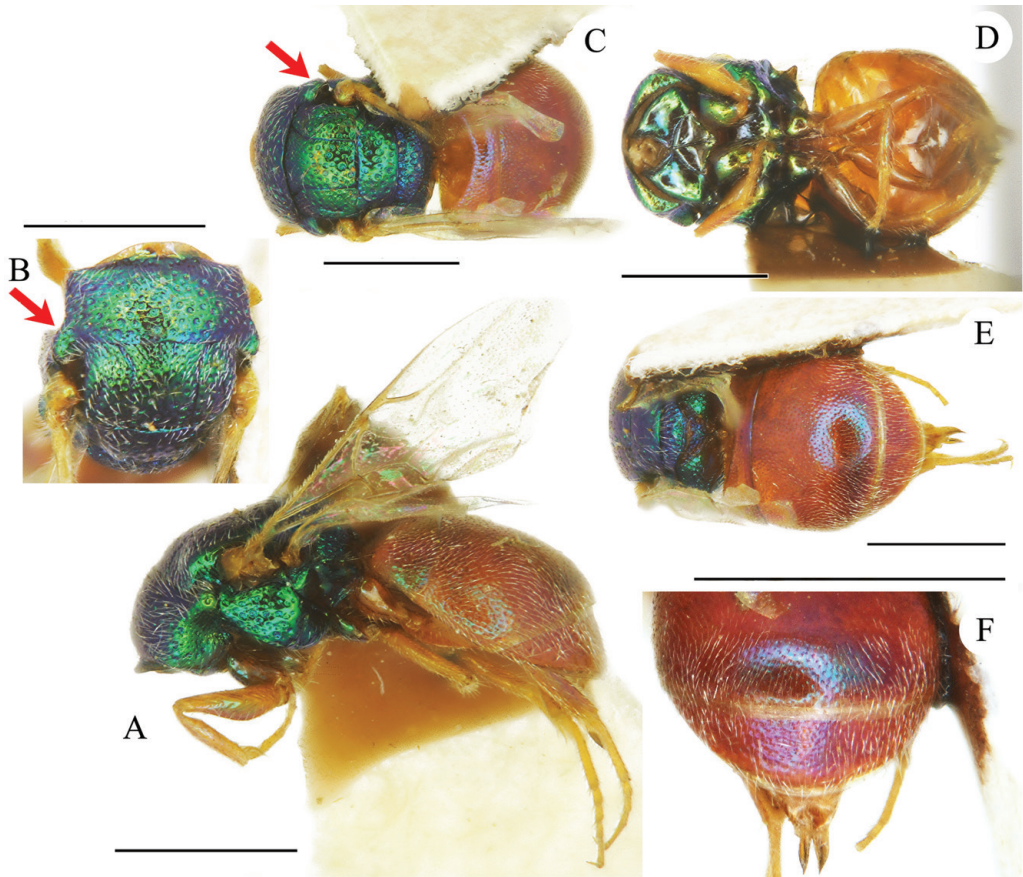


Fig. 1. *Hedychridium alatum* sp. nov. (holotype, female, Kazakhstan): A, habitus, lateral view; B, pronotum, dorsal view; C, habitus, dorsal view; D, habitus, ventral view; E, habitus, posterior view; F, Metasomal terga 2 and 3, dorsal view. Scale bars 1.0 mm.

dorsally, shorter laterally and ventrally as well as on legs.

Male unknown.

Etymology. The species epithet *alatum* (adjective meaning “winged”) refers to the unique shape of the pronotum having flattened and expanded (wing-shaped) posterolateral lobes (Figs 1B, 1C).

Distribution. Kazakhstan.

Comparative diagnosis. *Hedychridium alatum* sp. nov. is similar to the specimens of the *H. roseum* species group with non-metallic orange colouration of metasoma. However, several important features, namely the unmodified hind tarsomeres (in the *H. roseum* species group, these tarsomeres are robust, stocky and with the second tarsomere shorter than the third

one) and sparse mesosomal punctation as well as dense setae on mesosoma and metasoma, lead to include *H. alatum* sp. nov. in the *H. flos* species group. Among Central Asian species of the group, *H. alatum* sp. nov. is closely related to *H. semenovi* for the general habitus with metasoma partly non-metallic orange, for the body setae short, and for the punctures on mesosoma sparse and with polished interspaces. However, it is easily recognizable by the pronotal posterolateral corner flattened and dilated, wing-shaped (Figs 1B, 1C), and the fore femur unmodified (in *H. semenovi*, pronotal posterolateral corner slightly rounded, and fore femur carinate). *Hedychridium flos*, *H. sericifrons* and *H. znoikoi* show different general habitus compared to *H. alatum* sp.

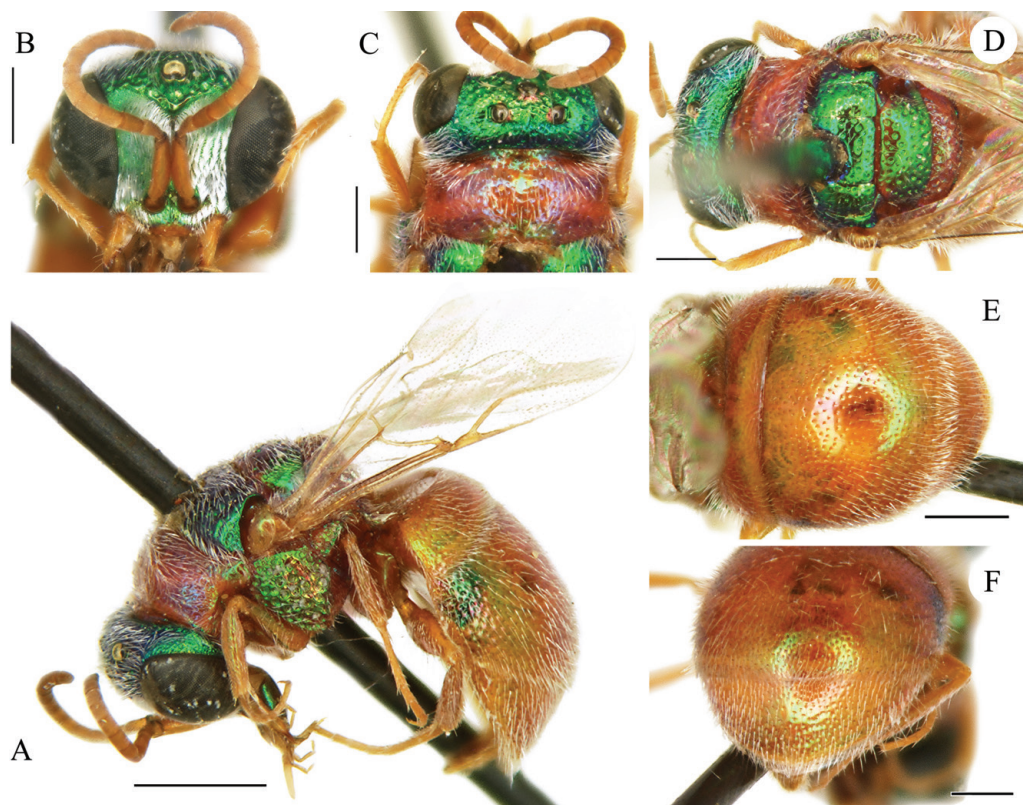


Fig. 2. *Hedychridium xanthum* Semenov (female, Kazakhstan): A, habitus, lateral view; B, head, frontal view; C, head and pronotum, dorsal view; D, mesosoma, dorsal view; E, metasoma, dorsal view; F, metasomal terga 2 and 3, dorsolateral view. Scale bars: A – 1.0 mm; others – 0.5 mm.

nov.: they have fore femur ventrally carinate, body colour full metallic, body punctures different, and vestiture more elongate (see pictures of these species in Rosa et al., 2017b). It is anyway to be stressed that male and some important features of female (e.g. head of the unique known specimen is missing) are unknown. When more specimens will become available, it cannot be excluded that *H. alatum* **sp. nov.** will have to be placed in a separate group.

Hedychridium xanthum (Semenov, 1967)

Remarks. During the examination of the *Hedychridium* material collected by V.L. Kazenas in Kazakhstan, I found another member of the *H. flos* species group with odd body coloration (Fig. 2). This specimen has bright green head and mesonotum, and

non-metallic orange antennae, pronotum, metanotum, propodeum, legs and metasoma; only metasomal tergum 2 shows a few small irregular green spots. Apart from body coloration and sparse metasomal punctation, other features suggest the specimen is conspecific with *H. xanthum* (Fig. 3).

It is well known that chrysidid wasps in arid, desert or semi-desert areas tend to show brassy or coppery coloration; moreover, some species of the genera *Hedychridium* and *Hedychrum* Latreille, 1802 develop a more or less extensively non-metallic orange metasoma (Linsenmaier, 1968). Nevertheless, so far such diverse body colorations of mesosoma within the same species were not yet recorded. Only Balthasar (1953) described some colour variations within a large series of *Hedychridium sexdentatum* collected in Wadi Kelt (Pales-

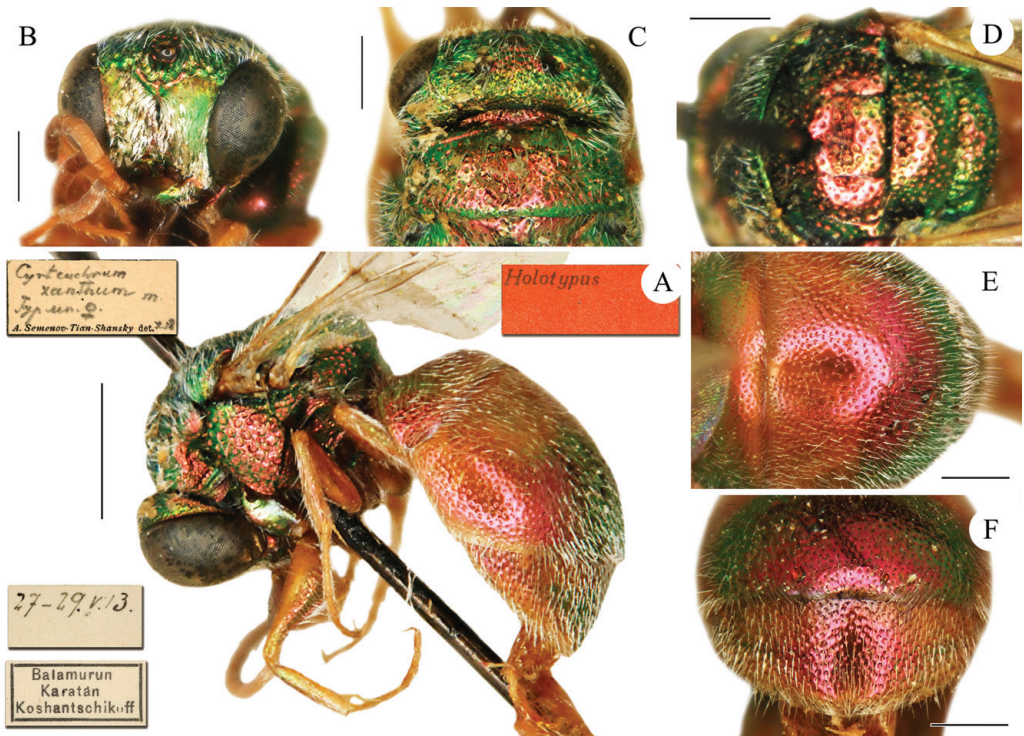
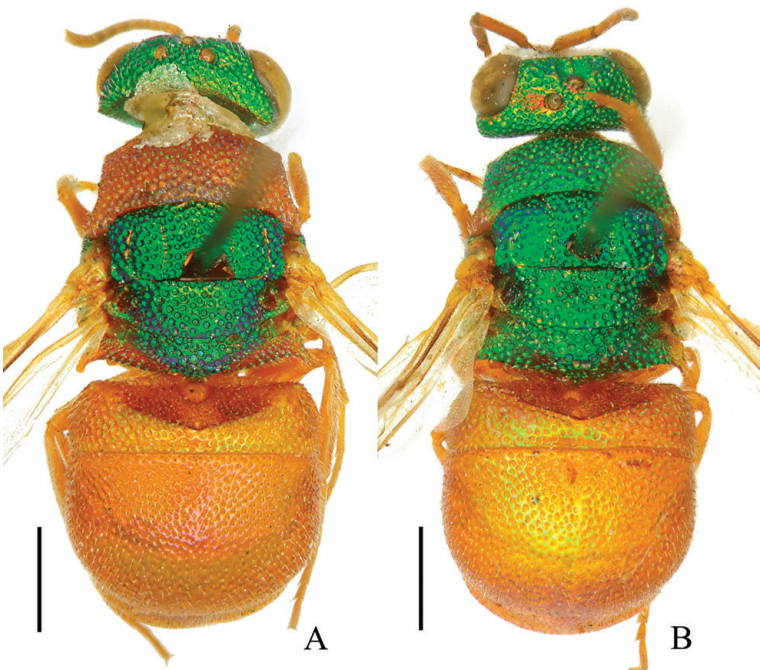


Fig. 3. *Hedychridium xanthum* Semenov (holotype, female, Kazakhstan): A, habitus (lateral view) and labels; B, head, frontal view; C, head, dorsal view; D, mesosoma, dorsal view; E, metasoma, dorsal view; F, metasomal terga 2 and 3, posterior view. Scale bars: A – 1.0 mm; others – 0.5 mm.



Figs 4. *Hedychridium sexdentatum* du Buys-son, habitus, dorsal view (females, Palestine, Wadi el Kelt, Jericho, leg. Houska): A, 25.VII.1944; B, 16.VII.1944. Scale bars 1.0 mm.

tine) by Houska. I examined ten specimens of this series housed at the Naturhistorische Museum in Vienna, finding a great variability in body coloration. In particular, some female specimens have the mesosoma entirely metallic red, while other ones have the same partially non-metallic orange: either entirely metallic green (Fig. 4B) or partially green with non-metallic flesh-coloured pronotum and propodeum (Fig. 4A).

Seemingly, there is a relation between more or less pronounced, to extreme, discoloration of body parts and arid or desert habitat, both in some *Hedychridium* species and within some populations of the same species. This variability is not yet observed in European or Russian species living in xeric habitats, although it should be noted that in these areas summer temperatures never reach the maximum levels found in Central Asia or in the Near East.

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