

## *Acraea cerasa* Hewitson, 1861: its morphological characters and systematic position (Lepidoptera, Nymphalidae, Heliconiinae, Acraeini)

Jacques PIERRE

Muséum national d'Histoire naturelle, Entomologie, C. P. 50, 57 rue Cuvier, F – 75231 Paris cedex 05 <jpierre@mnhn.fr>

(Accepté le 16.XI.2020 ; publié le 10.XII.2020)

**Abstract.** – *Acraea cerasa* Hewitson, 1861, is, depending on works, assigned to different genera. These different systematic positions are listed and discussed. The morphological and ecological data of this species and its relatives are taken into account in order to specify its phylogenetic position in the Acraeini. It is shown that *A. cerasa* do indeed belong to the clade *Acraea* (*Acraea*), *sensu* Pierre, 1987.

**Résumé.** – *Acraea cerasa* Hewitson, 1861 : caractères morphologiques et position systématique (Lepidoptera, Nymphalidae, Heliconiinae Acraeini). *Acraea cerasa* Hewitson est, selon les ouvrages, rangé dans différents genres. Ces différentes positions systématiques sont énumérées et discutées. Les données morphologiques et écologiques de cette espèce et des espèces affines sont prises en compte afin de préciser sa position phylogénétique au sein des Acraeini. Il est ainsi montré qu'*A. cerasa* appartient bien au clade *Acraea* (*Acraea*), *sensu* Pierre, 1987.

**Keywords.** – Phylogeny, morphology, ecology.

---

Following the works of HENNING (1992, 1993a, b), HENNING & WILLIAMS (2010) and WILLIAMS (2019, in his encyclopedia “*Butterflies and Skippers of the Afrotropical Region*”) place *Acraea cerasa* Hewitson, 1861, in the genus *Telchinia* Hübner, 1918. In the present article, the characters of this species are analysed, which leads to the conclusion that *cerasa* and closely related species belong to *Acraea* (*sensu* HENNING, 1992), or to *Acraea* (*Acraea*) (*sensu* PIERRE, 1987)<sup>1</sup>.

### METHODS

The phylogenetic works exploited here date back from a time when computers did not exist yet in most entomology laboratories and when, of course, molecular phylogeny was not even considered in dreams. Nevertheless, the Hennigian phylogeny — cladistics — was making its revolution and the search for synapomorphies was a commonplace objective. Nothing in the obtained results shows that this method, forgotten because of technical pressure and innovation, provides fewer or less “robust” data.

### RESULTS AND DISCUSSION

#### *Acraea* (*Acraea*) *cerasa* Hewitson, 1861

*Acraea cerasa* Hewitson, 1861: 40.

*Acraea* (*Acraea*) *cerasa* Hewitson; PIERRE, 1987, “*cerasa*” group; ACKERY *et al.*, 1995; <acraea.com>.

*Actinote* (*Hyalites*) *cerasa* (Hewitson); HENNING, 1992.

*Hyalites* (*Auracraea*) *cerasa* (Hewitson); HENNING, 1993a: 58.

*Hyalites* (*Hyalites*) *cerasa* (Hewitson); HENNING, 1993b: 104.

*Acraea* (*Acraea*) *cerasa* Hewitson; WILLIAMS, 2008.

---

<sup>1</sup> This article was in the process of being published (sent 11.VIII.2020) when Williams, to whom I had sent it previously, made the combination change of *Telchinia* (*Telchinia*) *cerasa* to *Acraea* (*Acraea*) *cerasa* (WILLIAMS & HENNING, 2020).

*Acraea (Acraea) cerasa* Hewitson; PIERRE & BERNAUD, 2013, 2014, “*cerasa*” group.  
*Telchinia (Telchinia) cerasa* (Hewitson); HENNING & WILLIAMS, 2010; WILLIAMS, 2019.  
*Acraea (Acraea) cerasa* Hewitson; BERNAUD *et al.*, 2019; WILLIAMS & HENNING, 2020.

*Acraea cerasa* Hewitson, 1861, and a few similar taxa regarded by ELTRINGHAM (1912), and others later on, as conspecific or closely related, are characterized by a marked transparency of the distal half of the forewing. This trait also occurs in many other *Acraea* that are not closely related to *A. cerasa*, with different causes (piliform scales, no scales at all...) and different results, which may however converge and lead to confusion and errors.

The truly significant characters that permit to assess the systematic position of the species<sup>2</sup> of the “*cerasa*” group are the following ones.

– Strongly asymmetrical pterothoracic claws, with the external claw hollowed out, provided with a longitudinal groove (PIERRE, 1985a) (fig. 1, type 7).

– Male genitalia with a well-developed, fairly long vinculum, whose posterior edge is sclerotized (PIERRE, 1985b) (fig. 2).

– Female genitalia with a sclerotized ductus bursae and with a well indicated ostium bursae opening on the sterigma (PIERRE, 1986) (fig. 3).

– Female sub-papillary gland ends anteriorly into terminal filamentous glands (not into a large terminal bag lying distad of the filamentous glands, a remarkable synapomorphy noticed by PIERRE, 1986) (fig. 4-5).

– Larval hostplants of *A. cerasa* and *A. kraka* belong to the Achariaceae (*Rawsonia lucida* Harv. & Sond., *Caloncoba*...), i.e. to Malpighiales (see WILLIAMS, 2019, BERNAUD, 1993, ACKERY *et al.*, 1995).

All these characters of the “*cerasa*” group allow a more precise approach but they are not restricted to it. They can be observed among nearly half of the *Acraea* (*sensu lato*). The characters that permit to distinguish two different lineages among the *Acraea* species are presented in table I. These two lineages are regarded as two subgenera (PIERRE, 1987), the subgenus being an optional category that prevents any introduction of disturbing binomina changes and preserves nomenclatural stability—a major preoccupation of the International Code of Zoological Nomenclature. Moreover, the two lineages do not present obvious external differentiating characters: no suitable key can be created for these two groups. One must firstly identify the species before one can know which “genus” it may belong to. It seems therefore unadvisable, or premature, to raise these two subgenera to generic rank.

**Table I.** – Distinctive characters of the two lineages of *Acraea* (PIERRE, 1987).

Characters	Clade I ( <i>Actinote</i> )	Clade II ( <i>Acraea</i> )
Pterothoracic claws ♂	Symmetrical or asymmetrical	Strongly asymmetrical + grooves
Sub-papillary gland (♀)	Distal (anterior) large pouch	Distal filamentous glands
Genitalia ♀	Ductus bursae membranous	Ductus bursae sclerotized
Genitalia ♂	Vinculum with membranous posterior edge	Vinculum with sclerotized posterior edge
Host plants	Rosales and derived	Malpighiales

Thus, one of the two lineages, which includes the neotropical species of *Actinote*, becomes the subgenus *Acraea (Actinote)*; the other one, to which belongs *A. horta*, the type species of the genus, becomes the nominative subgenus *Acraea (Acraea)*. The “*cerasa*” group clearly belongs to the latter subgenus.

<sup>2</sup> That is to say, currently, according to BERNAUD & PIERRE (1991) and BERNAUD & DUCARME (2008), *Acraea cerasa cerasa*, *A. cerasa cerita* (Sharpe, 1906), *A. unimaculata* Grose-Smith, 1898, and *A. kraka* Aurivillius, 1893.

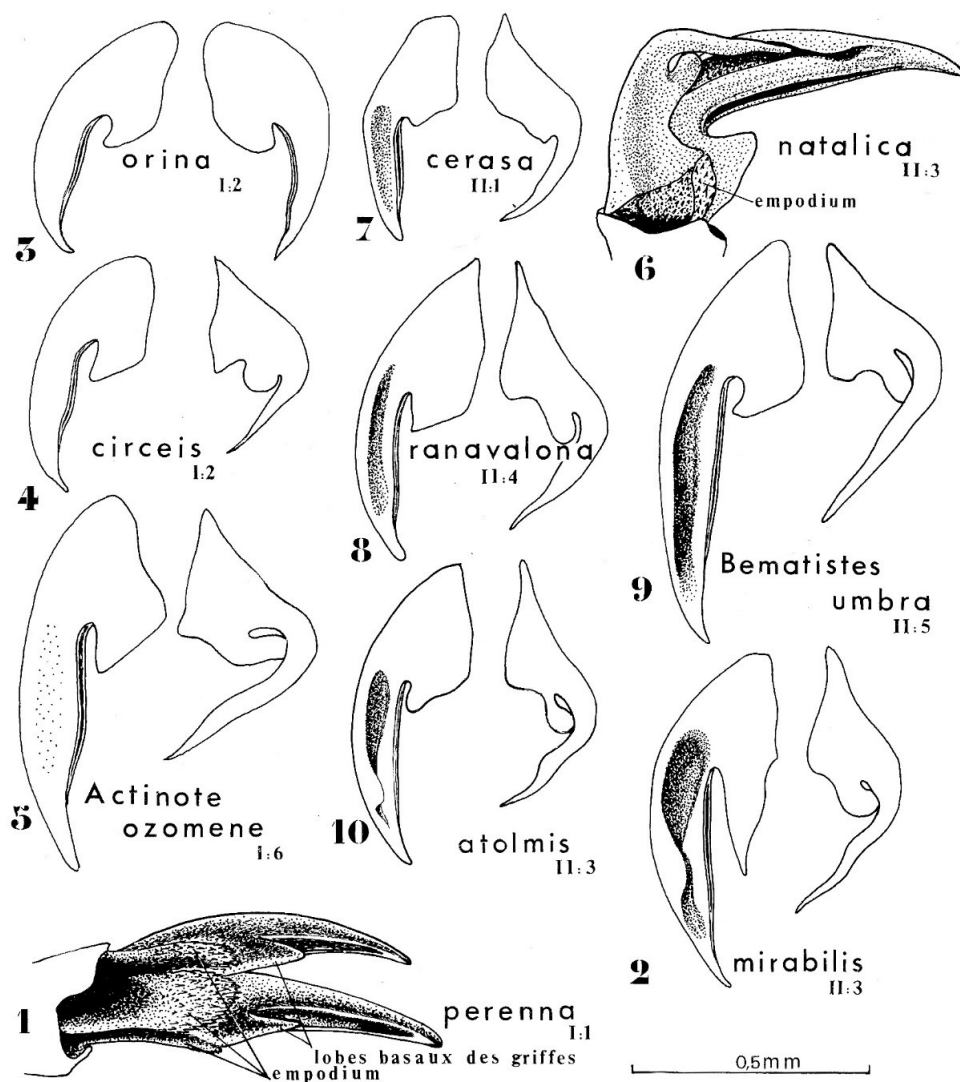
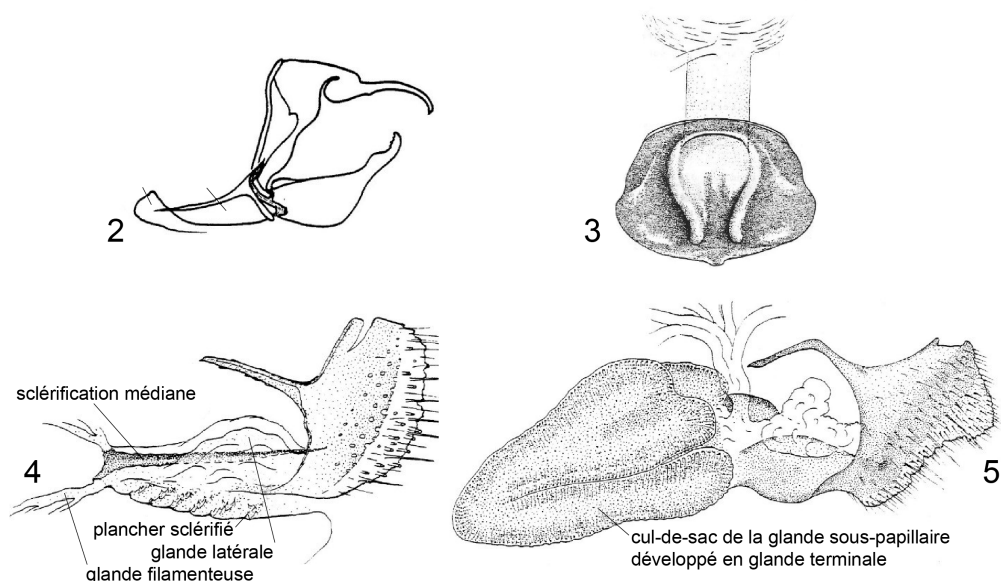


Fig. 1. – Main types (1 to 10) of claws in Acraeinae, with mention of lineage number (I, *Actinote*, or II, *Acraea*) and of species-group number.

According to the results of the purely morphological, Hennigian, phylogenetic study of PIERRE (1985a, b, 1986, 1987) (molecular analyses did not exist yet!), the former genus *Bematistes* is the sister group of the “*neobule*” and “*zetes*” groups of the subgenus *Acraea*, so it is part of this subgenus and must be considered synonymous with it. If one wished to maintain *Bematistes* as a genus (in a conservative approach?), the five groups of species of the same level should be regarded as genera. A damaging blow to nomenclatural stability! The credibility of systematics would be further undermined. It is better to get together related groups in the same genus than to scatter the species in too many taxa of “generic” level. Phylogeny and evolution, the foundations of systematics, are then revealed more explicitly. A current tendency to multiply the taxa regarded as “genera” is growing dangerously, the monotypic genera forming *in fine* the major part in the most studied classes, which sounds absurd! (PIERRE, 2018).



**Fig. 2-5.** – *Acraea* spp. – 2-4, *A. (Acraea) cerasa* Hewitson : 2, male genitalia in lateral view ; 3, female genitalia (sterigma, ostium and ductus bursae) ; 4, sub-papillary gland. – 5, *A. (Actinote) perenna* Doubleday, sub-papillary gland. (From PIERRE, 1986).

On the other hand, the “*cerasa*” group shows rarer characters, which isolate these species from the other groups of the subgenus *Acraea*. Thus, they have a peculiar sphragis (unique among *Acraea* species) composed of a preformed scale-plate of the male, laid on the female sterigma after copulation (PIERRE, 1985; CARVALHO *et al.*, 2017). These species and *A. rogersi* Hewitson, 1873, are the only ones within the subgenus to wear unaligned scales (a condition more commonly met in the subgenus *Actinote*). The larva of *A. kraka* possesses unbarbed scoli, i.e. scoli of a kind not known to occur elsewhere in the genus *Acraea* (BERNAUD, 1993); this character remains to be checked in *A. cerasa*.

In the subgenus *Acraea*, the various forms of the “*cerasa*” group, variable as they are already, could only be mistaken for *Acraea quirina* (Fabricius, 1781) or *A. kia* Pierre, 1990, and can only be identified by the observation of the pattern, the comparison with series of collection specimens, illustrations in articles (BERNAUD, 1995) or catalogues (PIERRE & BERNAUD, 2013), if not by dissection of the genitalia.

Many other *A. (Acraea)*<sup>3</sup> species present the same forewing transparency but are immediately distinguished by dark hindwing margins bearing orange, or very different, intervenular spaces. In the subgenus *A. (Actinote)*<sup>4</sup> too, there are several (easily confused) species with such a forewing transparency (PIERRE & BERNAUD, 2009).

HENNING (1992), wishing to maintain the well-known genera *Bematistes* and *Actinote* (recognized by many lepidopterists) but partially accepting the phylogenetic hypothesis of PIERRE (1987), slightly modified the results.

At first, he regarded the *Bematistes* species as the sister group of *Acraea*, although they have the same penis (a preponderant character for Graham Henning), the same claws (fig. 1, types 8 and 9) and sub-papillary glands with the same very large side pockets, as in the “*zetes*” and “*neobule*” groups. Consequently, its *Acraea* (divided into the subgenera *Acraea*, *Rubraea*

<sup>3</sup> *Acraea (Acraea) zonata, rabbaiea, chilo, machequena*, the whole group “*admatha*”, *punctimarginea, igati, dammii*...

<sup>4</sup> *Acraea (Actinote) igola, quirinalis, iturina et apud (kalinzu, rileyi), lia, orestia*...

and *Stephenia*) were paraphyletic. This problem was solved later by admitting the subgenus *Acraea* (*Bematistes*) (HENNING & WILLIAMS, 2010).

On the other hand, he divided *Acraea* (*Actinote*) into two genera, the original one, which is exclusively neotropical, and an “Old world *Actinote*” genus, as beautifully said by SILVA-BRANDÃO *et al.* (2008), named by HENNING (1992) from a synonym of *Acraea* (*Actinote*): *Hyalites* Doubleday, 1848. In fact, there is another synonym, which has priority, namely *Telchinia* Hübner, 1819! HENNING & WILLIAMS (2010) rectified that later. This genus is paraphyletic. *Telchinia* was also split into new subgenera, more or less corresponding to the groups of species adopted by PIERRE (1987) (with a few incomprehensible changes) : *Telchinia* (*Alacria*) for groups 1, “*perenna*”, and 2, “*parrhasia*”; *T. (Telchinia)* for groups 3, 4, 5 (respectively “*iturina*”, “*encedon*” and “*serena*”) and 6a (“*pentapolis*”)! ; *T. (Auracraea)* (syn. *Aurora*, a preoccupied name) for group 6b.

In the key to the subgenera of *Telchinia* published by HENNING & WILLIAMS (2010), one can read « 1. Hind wings with a rudimentary vein between second anal and second cubital veins ..... *Auracraea* ». One must note that this line is also true for the neotropical species of *Actinote* which, sharing this reversal (a synapomorphy), could thus be placed in this subgenus! This clearly shows the weak merits of the distinction between these genera.

Although *Acraea cerasa* shows the different features indicated above as characteristic of the genus *Acraea* (*sensu* Henning) or subgenus *A. (Acraea)* (*sensu* Pierre), it appears in several articles under various combinations: as *Hyalites* (HENNING, 1992, 1993) and, later, as *Telchinia* (HENNING & WILLIAMS, 2010; WILLIAMS, 2018)...

In these same publications, *Acraea rogersi* Hewitson, 1873, appears in the subgenus *Stephenia*, i. e. in the “*natalica*” group, which is characterized by, notably, very peculiar pterothoracic claws, the groove of the internal claw being distally closed by an expansion of its superior lip (fig. 1, type 10). *A. rogersi* is completely different, its claws being fairly similar to those of *A. cerasa*, while it possesses other specific characters that make it totally unique.

## CONCLUSION

The purpose of the present article is to draw attention to what seems to be taxonomic errors.

As already evoked in the “Methods” section, the molecular phylogeny, now preponderant, would be more reliable than Hennigian phylogeny (based on morphology, ecology...). However, the latter relates to characters that can be observed, illustrated, and, potentially, polarized via certain methods (i.e. interpreted as plesiomorphic or apomorphic in a conceivable evolutionary process). If similar results might possibly be obtained with molecular characters, nucleotides and their sequence (i. e. synapomorphies), as a rule these data are not exploited very rigorously: instead of being truly analysed, the raw sequences are treated statistically, automatically, with fashionable softwares, which necessitates multiplying genes and sequences to get best results.

Both phylogenetic methods are certainly useful and necessary insofar as they are complementary and may support each other, provided that the analyses are performed on almost all species of a group and not by random sampling within an allegedly monophyletic or homogeneous group! I hope that we will soon be able to carry out a molecular phylogenetic analysis of the whole genus *Acraea*, i. e. the *Acraeini*.

ACKNOWLEDGEMENTS. – I would like to thank Fabienne Giard, Claude Joly and more especially Joël Minet for their assistance for the critical reading of the manuscript, suggestions and improving the English version.

## REFERENCES

- ACKERY P. R., SMITH C. R. & VANE-WRIGHT R. I. (eds), 1995. – *Carcasson's African Butterflies: an annotated catalogue of the Papilionoidea and Hesperioidea of the afrotropical region*. East Melbourne : CSIRO, 803 p. <https://doi.org/10.1071/9780643100787>



- BERNAUD D., 1993. – Premiers stades d'*Acraea kraka* Aurivillius (Lepidoptera, Nymphalidae). *Lambillionea*, **93** (3) : 297-299.
- BERNAUD D., 1995. – Les *Acraea* et leurs plantes-hôtes (cas du Mont Bana). *Lambillionea*, **95** (2) : 235-243.
- BERNAUD D. & DUCARME R., 2008. – Revue du clade II.1 (groupe de *Acraea cerasa*) sur la base de captures récentes (Lepidoptera, Nymphalidae, Acraeinae). *Entomologia africana*, **13** (2) : 45-52.
- BERNAUD D., LEQUEUX J.-P. & ZIRAYE M., 2019. – *Acraeinae of Uganda* (Lepidoptera, Nymphalidae). D. Bernaud éd., 700 p.
- BERNAUD D. & PIERRE J., 1991. – A propos d'*Acraea kraka* Aur. au Cameroun (Lepidoptera, Nymphalidae). *Lambillionea*, **91** (1) : 319-322.
- CARVALHO A. P. S., ORR A. G. & KAWAHARA A. Y., 2017. – A review of the occurrence and diversity of the sphragis in butterflies (Lepidoptera, Papilionoidea). *ZooKeys*, **694** : 41-70.  
<https://doi.org/10.3897/zookeys.694.13097>
- ELTRINGHAM H., 1912. – A Monograph of the African Species of the Genus *Acraea* Fab., with a supplement on those of the Oriental region. *Transactions of the Royal Entomological Society of London*, **60** (1) : 1-369.  
<https://doi.org/10.1111/j.1365-2311.1912.tb02511.x>
- HENNING G., 1992. – Phylogenetic notes on the african species of the subfamily Acraeinae - Part 1 (Lepidoptera: Nymphalidae). *Metamorphosis*, **3** (3) : 113.
- HENNING G., 1993a. – Phylogenetic notes on the african species of the subfamily Acraeinae - Part 2 and part 3 (Lepidoptera: Nymphalidae). *Metamorphosis*, **4** (2) : 58.
- HENNING G., 1993b. – Survival strategies in the Acraeinae (Lepidoptera: Nymphalidae). *Metamorphosis*, **4** (2) : 104.
- HENNING G. A. & WILLIAMS M. C., 2010. – Taxonomic notes on the Afrotropical taxa of the tribe Acraeini Boisduval, 1833 (Lepidoptera: Nymphalidae: Heliconiinae). *Metamorphosis*, **21** (1) : 2-38.
- HEWITSON W. C., 1861. – *Illustration of new species of Exotic Butterflies, selected chiefly from the collections of W. Wilson Saunders and William C. Hewitson*. Volume II. London : John Van Voorst.
- PIERRE J., 1985a. – Morphologie des griffes des *Acraeinae* (Lépidoptères Nymphalides). *Compte Rendu de l'Académie Sciences de Paris*, (III) **300** (8) : 333-336.
- PIERRE J., 1985b. – Morphologie comparée de l'appareil génital mâle des *Acraeinae*. *Annales de la Société entomologique de France*, (N. S.) **21** (4) : 381-391.
- PIERRE J., 1986. – Morphologie comparée de l'appareil génital femelle des *Acraeinae* (Lepidoptera Nymphalidae). *Annales de la Société entomologique de France*, (N. S.) **22** (1) : 53-65.
- PIERRE J., 1987. – Systématique cladistique chez les *Acraea* (Lepidoptera Nymphalidae). *Annales de la Société entomologique de France*, (N. S.) **23** (1) : 11-27.
- PIERRE J., 2018. – Problème de Genre en zoologie. *Lepidoptera*, **27** (71) : 98-100.
- PIERRE J. & BERNAUD D., 2009. – Nymphalidae XVI, *Acraea* subgenus *Actinote*. In : Bauer E. & Frankenbach T. (éds), *Butterflies of the World*, part **31**, 5 p. + 19 pl. + supplément **16**, 19 p.
- PIERRE J. & BERNAUD D., 2013. – Nymphalidae XXIII, *Acraea* subgenus *Acraea*. In : Bauer E. & Frankenbach T. (éds), *Butterflies of the World*, part **39**, 8 p. + 28 pl. + supplément **22**, 27 p.
- PIERRE J. & BERNAUD D., 2014. – Genre *Acraea* Fabricius, 1807: Liste systématique, synonymique et liste des noms infrasubspécifiques. In : Bauer E. & Frankenbach T. (eds), *Butterflies of the World*, suppl. 24 : 30 p.
- SILVA-BRANDÃO K. L., WAHLBERG N., FRANCINI R. B., AZEREDO-ESPIN A. M. L., BROWN K. S. Jr, PALUCH M., LEES D. & FREITAS A. V. L., 2008. – Phylogenetic relationships of butterflies of the tribe Acraeini (Lepidoptera, Nymphalidae, Heliconiinae) and the evolution of host plant use. *Molecular Phylogenetics and Evolution*, **46** : 515-531. <https://doi.org/10.1016/j.ympev.2007.11.024>
- WILLIAMS M. C., 2008. – *Butterflies and Skippers of the Afrotropical Region*. 8<sup>th</sup> edition.
- WILLIAMS M. C., 2019. – *Butterflies and Skippers of the Afrotropical Region*. 18<sup>th</sup> edition. <http://www.m metamorphosis.org.za/?p=articles&s=atb> [consulté le 8.X.2020]
- WILLIAMS M. C. & HENNING G. A., 2020. – Taxonomic note on three species in the tribe Acraeini Boisduval, 1833 (Lepidoptera: Nymphalidae: Heliconiinae). *Metamorphosis*, **31** (1) : 81.