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### FIRST RECORDS OF THE *CHRYSIS LEACHII* GROUP FROM SUB-SAHARAN AFRICA, WITH DESCRIPTION OF A NEW SPECIES (HYMENOPTERA, CHRYSIDIDAE)

P. Rosa

Laboratory of Zoology, Institute of Biosciences, University of Mons, Place du Parc, 20, 7000, Mons, Belgium. E-mail: [paolo.rosa@umons.ac.be](mailto:paolo.rosa@umons.ac.be)

**Summary.** The *Chrysis leachii* species group is recorded from sub-Saharan Africa for the first time with two species: *Chrysis rasnitsyni* sp. n. (from Central African Republic, Ivory Coast, and Senegal) and *Chrysis nilensis* Linsenmaier, 1959 (Ivory Coast, Sudan). The lectotype of *Chrysis leachi* var. *cyanea* du Buysson, 1908 is designated. Illustrations of the two species are presented.

**Key words:** cuckoo wasps, Chrysidini, taxonomy, new species, description, lectotype designation, Afrotropical region.

**П. Роза. Первые находки группы *Chrysis leachii* из Африки к югу от Сахары с описанием нового вида (Hymenoptera, Chrysididae) // Дальневосточный энтомолог. 2021. N 437. С. 16-23.**

**Резюме.** Впервые из Африки к югу от Сахары приводятся два вида группы *Chrysis leachii*: *Chrysis rasnitsyni* sp. n. (Центральноафриканская Республика, Кот-д'Ивуар и Сенегал) и *Chrysis nilensis* Linsenmaier, 1959 (Кот-д'Ивуар и Судан). Обозначен лектотип *Chrysis leachi* var. *cyanea* du Buysson, 1908. Даны иллюстрации обоих видов.

#### INTRODUCTION

Linsenmaier (1959) established the *Chrysis leachii* species group based on 15 West-Palaearctic species. He later described another three North African species (1968) and Kimsey & Bohart (1991) added a Central Asia species, *Chrysis infantula* Semenov-Tian-Shanskij, 1967. After the publication of the world catalogue by Kimsey & Bohart (1991), another ten species were described in this species group: four from the Canary Islands (*C. atrocomitata*, *C. globiscutella*, *C. magnifacialis*, and *C. umbofacialis* by Linsenmaier 1993); one from the Arabian Peninsula (*Chrysis hattaensis* Linsenmaier, 1994); one from Tunisia (*C. wolfi* Linsenmaier, 1999); two from the Mediterranean Basin (*C. alcudiae* Reder & Arens, 2012 and *C. aegeriaca* Arens, 2016), one from southern Russia (*Chrysis lyda* Rosa in Rosa *et al.*, 2017b) and another one from Siberia (*C. proauriceps* Rosa in Rosa *et al.*, 2017a). Based on the known species, the *C. leachii* group was supposed to have a West Palaearctic chorotype only (Kimsey & Bohart, 1991). In fact, no taxa have been recorded for sub-Saharan Africa, so far (Madl & Rosa, 2012).

During the examination of the Linsenmaier collection housed at the Natur-Museum in Luzern (Switzerland) (Rosa *et al.*, 2015), we discovered that the Swiss author owned twenty Afrotropical specimens of this group identified as *Chrysis annectilinea*, from Ivory Coast, and *C. afroleachii*, from Ivory Coast and Sudan. Although these specimens were labelled as types, their description was never published and they must be considered as nomina in collection. More recently, Marek and Jirí Halada (České Budějovice, Czech Republic) collected another nine specimens of Linsenmaier's *annectilinea* from Senegal and Central African Republic.

In the present article we describe a new African species in the *Chrysis leachii* group and report the presence of a second one, namely *Chrysis nilensis* Linsenmaier, 1959, thus extending the chorological distribution of this group to the Afrotropical realm. We also designate the lectotype of the second African species, *C. leachi* var. *cyanea* du Buysson, 1908 *nec* Linnaeus, 1758, currently *C. nilensis* Linsenmaier, 1959.

#### MATERIAL AND METHODS

Holotype and paratypes of the new species are deposited at the Natur-Museum, Luzern (Switzerland, NMLU). Other paratypes are deposited in the private collection of the author and in the private collection of Marek Halada (České Budějovice, Czech Republic, MHC). Specimens were studied and photographed with a Tegal SCZ microscope connected to a Nikon D80 and stacked with the software Combine ZP. Pictures of the male of *C. rasnitsyni* were taken with Canon EOS 40D and EOS 7D with Canon 100 and MPE 65 macro lenses.

Morphological terminology follows Lanes *et al.* (2020) and Kimsey & Bohart (1991). Abbreviations as follows: F1, F2, F3, etc. = flagellomeres 1, 2, 3, etc., respectively; l/w=length/width; MOD = anterior ocellus diameter; MS = malar space, the shortest distance between base of mandible and lower margin of compound eye; OOL = the shortest distance between posterior ocellus and compound eye; P = pedicel; PD = puncture diameter; POL = the shortest distance between posterior ocelli. Museum acronyms: Muséum National d'Histoire Naturelle, Paris, France (MNHN); Naturhistorisches Museum Wien, Vienna, Austria (NHMW).

#### TAXONOMY

##### Subfamily Chrysidinae Latreille, 1802

##### Tribe Chrysidini Latreille, 1802

##### Genus *Chrysis* Linnaeus, 1761

*Chrysis* Linnaeus, 1761: 414. Type species: *Sphex ignita* Linnaeus, 1758 [= *Chrysis ignita* (Linnaeus, 1758)], by subsequent designation of Latreille, 1810: 437.

##### *Chrysis leachii* species group

*Chrysis (Chrysis) leachii* group: Linsenmaier 1959: 92 (key to species group); 117–118 (diagnosis, keys), 190 (catalogue of the species); 1999: 161 (diagnosis).

*Chrysis succincta-leachii* subgroup: 364 (diagnosis, host, discussion).

DIAGNOSIS. Very small to small species (2.5–5.0 mm), usually brightly coloured, with apex of third metasomal tergum edentate or with short median tooth, sometimes lanceolate, rarely with blunt angles at sides of apical margin (in *Chrysis excursa* Linsenmaier, 1959 medially notched, yet the placement of this species in the *leachii* group must be confirmed); malar spaces short and strongly convergent; scapal basin broadly microridged in both sexes;

transverse frontal carina faint; black spots on sternum II medium (covering about half segment length) to large (covering 2/3rds of segment length), subsquare or subrectangular, separated by a narrow metallic line.

REMARKS. The *Chrysis leachii* group is a small group of homogeneous species, with similar size, habitus, and colour pattern, with few exceptions. It is closely related to the *C. succincta* group, however, females can be immediately separated by the scapal basin broadly microridged (medially polished and laterally micropunctate in *C. succincta* group). It may be difficult for beginners to identify males of some species; in fact, they can be confused with small members of the *C. succincta* group because of their greenish body colour and the simple apex of third tergum. In this case, a combination of diagnostic characters must be taken into consideration, e.g. the presence/absence of the frontal carina, the shape of the black spots on second sternum, and the shape of the genital capsule. Apart from species of the Canaries Islands, only two species have both sexes with a completely green body: *Chrysis nilensis* Linsenmaier, 1959 (Fig. 3) and *C. infantula* Semenov-Tian-Shanskij, 1967. Kimsey & Bohart (1991) classified the *C. leachii* group as a subgroup of the *C. succincta* group; we follow Linsenmaier's (1959, 1999) classification, which was recently supported by phylogenetic analysis (Pauli et al., 2019).

HOSTS. Species of the family Crabronidae, genus *Miscophus* Jurine, 1807 and *Diodontus* Curtis, 1834 (Linsenmaier, 1959; Rosa, 2006; Gert et al., 2010).

### *Chrysis rasnitsyni* Rosa, sp. n.

<http://zoobank.org/NomenclaturalActs/DAE96265-95F4-4C01-921D-A78E6FD44E3C>

Figs 1A–B, 2A–D, 3A–E

TYPE MATERIAL. Holotype – ♀, **Ivory Coast**: Denguélé, Odienné 20.IV 1980, [leg. W. Perraudin], coll. Linsenmaier (NMLU). Paratypes: same locality, collector and depository: 5♀, VIII 1979; 1♀, XI 1979; 2♀, 20.IV 1980; 3♀, Odienné, 6.IV 1978, leg. W. Perraudin (NMLU); 2♀, idem, 9.IV 1980; 1♀, 17.V 1980; 2♀, idem, XI 1980. **Senegal**: 3♀, 10 km E of Medina Gounas, 13°08.05'N 13°42.03'W, 25.VI 2004, leg. M. Halada (MHC); 2♀, 15 km E of Velingara, 28.VI 2004, leg. M. Halada (MHC); 1♂, 70 km of W Tambacounda, 13°57.39'N 14°15.92'W, 29.VI 2004, leg. M. Halada (MHC). **Central African Republic**: 1♀, 60 km SE of Bouar, 05°42'N 16°00'E, 30.III 2010, leg. J. Halada (MHC); 2♂, Koukorou-Bamingui Reserve, 07°15'N 20°03'E, 20.IV 2010, leg. J. Halada (MHC).

DESCRIPTION. FEMALE. Body length: 4.5 mm.

Head. OOL  $1.7 \times \text{MOD}$ ; POL  $2.6 \times \text{MOD}$ ; MS  $1.5 \times \text{MOD}$ ; relative length of P: F1: F2: F3 = 1.0: 1.3: 0.7: 0.6. Frons between scapal basin and anterior ocellus with dense, polygonal, large (about  $0.6\text{--}0.8 \times \text{MOD}$ ) and contiguous punctures, without polished interspaces; punctures arranged radially around anterior ocellus (Fig. 1); head posterior to ocelli with smaller punctures and narrow interspaces; with small punctures aligned below eye; transverse frontal carina faint; scapal basin deep, with median narrowing, polished below frontal declivity, with sharp ridges, shallower along longitudinal midline; face between scapal basin and eye margin with large, contiguous punctures (Fig. 2B); genal carina straight, sharp, fully developed from mid eye to mandibular insertion; malar spaces relatively long ( $1.3 \times \text{MOD}$ ); subantennal space extremely short,  $0.5 \times \text{MOD}$ ; apex of clypeus with thin brown rim.

Mesosoma. Medial pronotal line large and elongate, reaching posterior margin of pronotum (Fig. 1A); pronotum as long as mesoscutellum, with deep, large punctures, as large as those on frons, rounded and with narrow, polished interspaces; mesoscutum with larger punctures on median area; notauli formed by deep, large foveae, with diameter similar to larger punctures; parapsidal signum almost faint, its area indicated by darker colour; mesoscutellum with irregular sized punctures; mesoscutellar-metanotal suture unusual, formed by deep, longitudinally elongate punctures, particularly elongate at sides, toward metanotal trough;

metanotum punctures similar to scutellum; posterior propodeal projections slightly divergent, covered by deep, dense, small punctures; mesopleuron with large punctures, episternal sulcus formed by large confluent foveae, as well as scrobal sulcus.

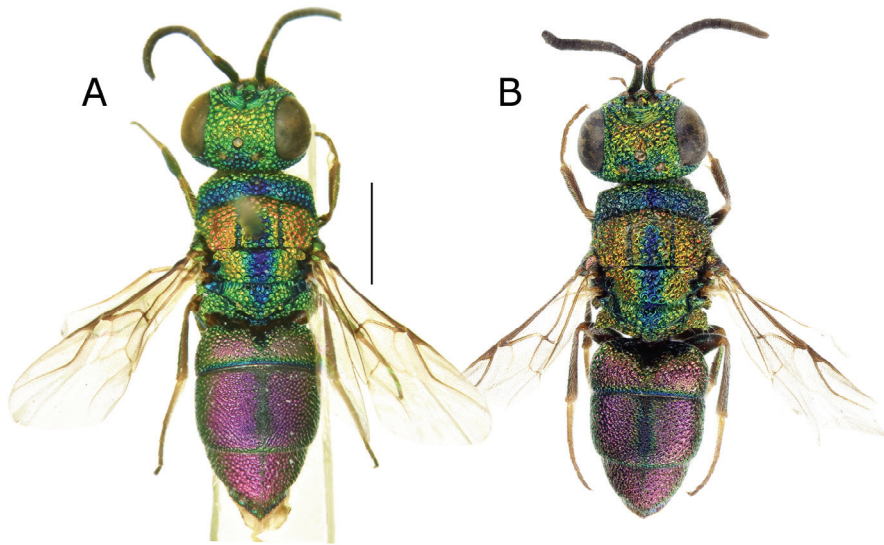


Fig. 1. *Chrysis rasnitsyni* sp. n., habitus, dorsal view: A – female from Ivory Coast; B – male from Central African Rep. Scale bar 1.0 mm.

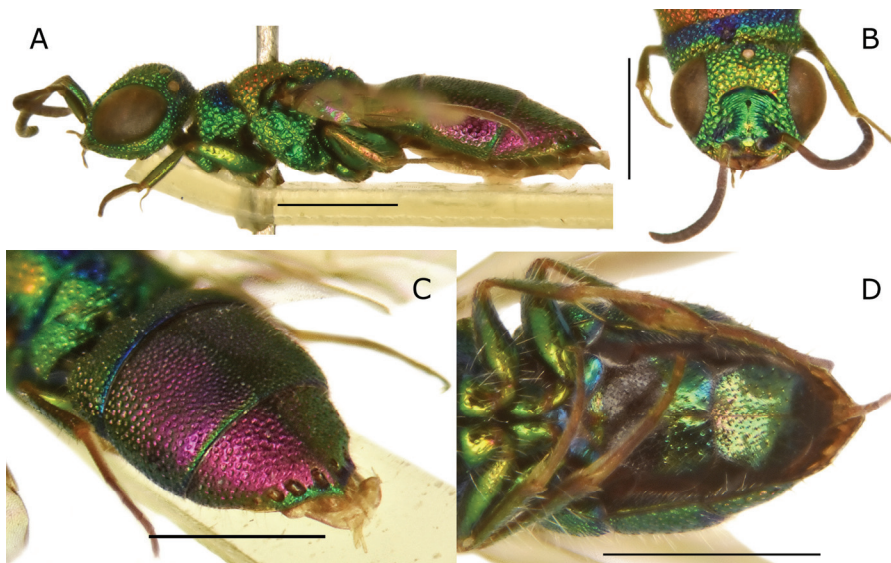


Fig. 2. *Chrysis rasnitsyni* sp. n., female: A – habitus, lateral view; B – head, frontal view; C – metasoma, postero-lateral view; D – metasoma, ventral view. Scale bars 1.0 mm.

Metasoma. Tergum I with distinct double punctation, with deep, large punctures and interspaces densely punctate by small punctures (Fig. 1A); largest punctures smaller than those on mesonotum and metanotum; antero-median concavity deep and wide; tergum II with dense, even punctures dorsally, sparser on segment sides (Fig. 2A); median longitudinal carina on terga II-III indicated by non-metallic black line; tergum III without slight pre pit swelling; pits of pit row small, deep, longitudinally elongate (Fig. 2C); tergum III, in dorsal view, triangular (Fig. 1), with sharp median tooth (Fig. 2C); black spots on sternum II square, as long as half of segment length, posteriorly separated by thin metallic line (Fig. 2D).

Colour. Head metallic green with feeble golden reflections; pronotum dorsally blue, anteriorly and laterally green; mesonotum red to orange, metanotum and propodeum green; mesoscutum and metanotum with large, median, longitudinal, blue line; metasoma purple with posterior margin of each tergum green to blue, including the apical margin of third tergum; scape and pedicel green; flagellomeres dark brown; tegulae metallic green; wings hyaline with light brown nervures; legs green, meso- and metalegs red on outer side; sterna metallic green.

Variability. Specimens from Senegal are less brightly coloured.

MALE. Similar to female (Figs 1B, 3A-E), with dimorphic apical margin of third metasomal tergum less pointed.

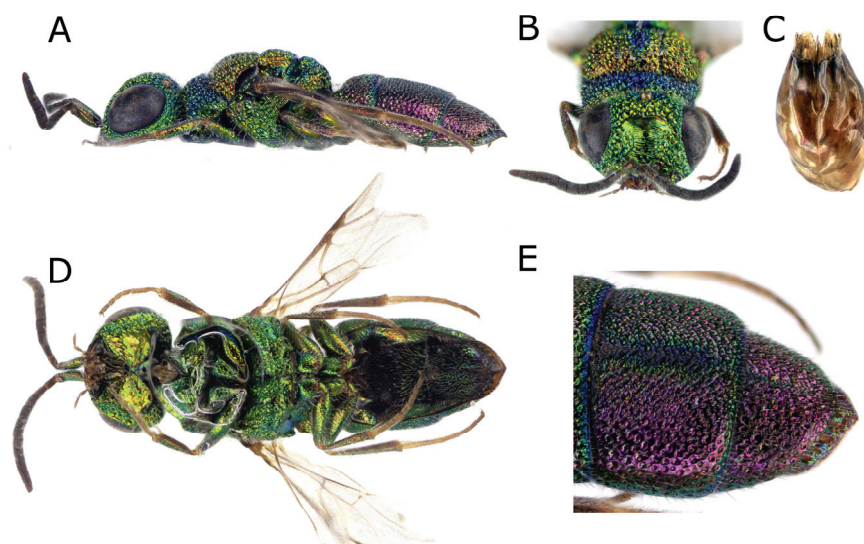


Fig. 3. *Chrysis rasnitsyni* sp. n., male from Central African Republic: A – habitus, lateral view; B – head, frontal view; C – genital capsule; D – habitus, ventral view; E – metasoma, dorso-lateral view. Scale bars 1.0 mm.

DIAGNOSIS. *Chrysis rasnitsyni* sp. n. is easily recognisable in the *C. leachii* group for several diagnostic features: unique body colouration, with blue median line from mesoscutum to scutellum and purple metasoma; large, deep and dense punctures on head and mesosoma; apical margin of the third metasomal tergum triangular, with median pointed tooth; pits of the pit row deep and elongate. The other known sub-Saharan member of this group, *C. nilensis*

(reported here for the first time), has both sexes entirely green to blue; sparser punctuation, shallow and largely sparse on scutellum; apex of third tergum with shorter, blunt median tooth. The same diagnostic characters separate *C. rasnitsyni* from all northern African species revised by Linsenmaier (1999).

ETYMOLOGY. The specific epithet *rasnitsyni* is a patronym honouring Prof. Dr. Alexandr P. Rasnitsyn on the occasion of his 85th birthday and in recognition of his contributions to the study of the Hymenoptera, including Chrysididae.

***Chrysis nilensis* Linsenmaier, 1959**

Fig. 4A–F

*Chrysis leachi* [!] var. *cyanea* du Buysson, 1908: 49, *nom. praeocc., nec* Linnaeus, 1758.

Syntype ♀♀; Egypt: Cairo: Wadi Hoff, leg. R. Père P. Teilhard (MNHN).

*Chrysis nilensis* Linsenmaier, 1959: 121. Replacement name for *Chrysis leachii* var. *cyanea* du Buysson, 1908, *nec* Linnaeus, 1758.

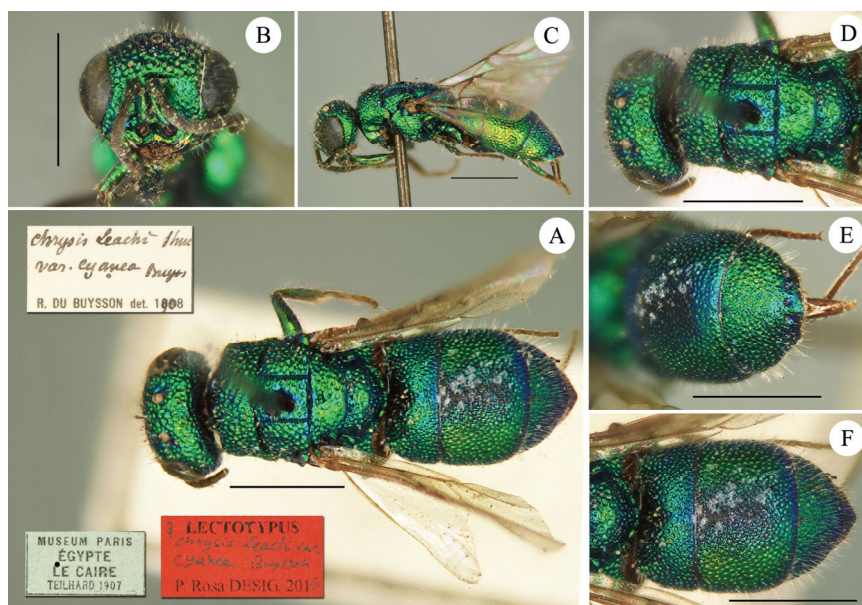


Fig. 4. *Chrysis leachi* var. *cyanea* du Buysson, 1908, lectotype, female. A – habitus, dorsal view; B – head, frontal view; C – habitus, lateral view; D – mesosoma, dorsal view; E – metasoma, posterior view; F – metasoma, dorsal view. Scale bars 1.0 mm.

MATERIAL EXAMINED. Lectotype (**herein designated**) – ♀, **Egypt**: Museum Paris Égypte Le Caire Teilhard 1907 // *Chrysis leachi* [!] Shuc. var. *cyanea* Buyss. R. du Buysson det. 1908 // ♀ Lectotypus *Chrysis leachi* var. *cyanea* Buysson P. Rosa desig. 2016 (MNHN). 1♀, Coll. A. Mochi 10.VI 37 Ezbet El Nakt Égitto // *Monochr. leachi* [!] *cyanea* Buyss. det. Zimmermann (NHMW). **Sudan**: ♀, El Damer Hudeiba 13.10 61 leg. R. Remane Staatsslg. München // ♀ Paratype *Chrysis* L. *afroleachii* Lins. det. Linsenmaier 1974 // No type sp. in litteris P. Rosa det. 2010 GBIF-Chrysididae // ex synoptic collection // NML\_ENT GBIF\_Chr00022776 (NMLU). **Ivory Coast**: 1♀, Odienné C.I. 18.XI 1978 coll. W. Perraudin // ex synoptic collection // NML\_ENT GBIF\_Chr00022776 (NMLU).

REMARKS. *Chrysis leachi* var. *cyanea* du Buysson, 1908 was described on five female specimens collected by P. Teilhard at Wadi Hoff (Cairo). Linsenmaier (1959) replaced the name, homonym of *C. cyanea* Linnaeus, 1758, with *C. nilensis* and upgraded the taxon to specific rank. Two specimens of *C. nilensis* were found in Linsenmaier's collection, one from Sudan and another one from the Ivory Coast. The presence of *C. nilensis* in Sudan was expected; in fact, the locality El Damer is located along the Nile river. More interesting is the finding of this species in Ivory Coast. All examined specimens in collections show a noticeably variability in punctation, shape of the apical tooth on the third tergum, and shape of the black spots on the second metasomal sternum. Since Linsenmaier considered the Sudanese specimen a member of a separated species (and proposed the name *afroleachii*, never published), we here designate the lectotype of *C. leachi* var. *cyanea* to fix the current interpretation of the species *sensu* Linsenmaier (1959). An examination of further material is anyway need to evaluate the variability of this taxon in Africa, and eventually proceed with the description of related species.

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