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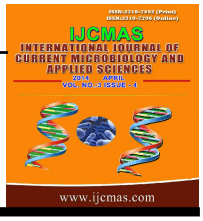

Original Research Article

Identification Key to Species of Sceliphrini (Hymenoptera: Sphecidae: Sphecinae) with illustration of male genitalia in Iraq

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Keywords

Iraq, Sphecinae, Sceliphrini, mud dauber wasps, *Sceliphron*, *Chalybion*

A B S T R A C T

In this study, 258 specimens of Sceliphrini tribe (Hymenoptera: Sphecidae: Sphecinae), collected from different region of Iraq are investigated. Five species belonging to two genera were determined.The current study recorded five types of this tribe belonging to both sexes and as follows: *Chalybion flebile*,(Lepeletier) *Sceliphron madraspatanum* (Fabricius), *Sc. arabs* (Lepeletier)**,** *Sc. pietschmanni* (Kohl) and *Sc. rectum* Kohl. The last species is recorded for the first time in Iraq. Identification keys to genera, species and figured of male genitalia are illustrated.

Introduction

The Sphecidae is a cosmopolitan family of wasps, currently there are 9660 described species distributed throughout the world (Pulawski, 2009). Adults feed on nectar, pollen and juices containing high amount of sugar while the larvae need adults or larvae of different insect orders and Araneida (Murray, 1940; Gillott, 2005).

The Sceliphrini probably has the widespread of ethological diversity of any sphecid tribe, the best known genera of this group are *Chalybion* Dahlbom and *Chlorion* Latreille, many species of which are metallic green or blue, and *Sceliphron* Klug which contains the yellow and black "mud dauber wasps", which can be recognized by tarsi with plantulae and/or claws of some legs with one mesal tooth on inner margin (Bohart & Menke, 1976).Hensen(1988) mentioned that the distribution of these wasps has probably long been assisted by human activity.

van der Vecht & van Breugel (1968) were revised genus of *Sceliphron* and divided to two subgenera: *Sceliphron* Latreille and *Prosceliphron* van der Vecht used many characters: distance between compound eyes, present sculptures on metapleuron or none, present of teeth on inner margin of mandibles or absent and addition found of anal cerci or none in males and shape of sternite 6 (S6) in females. The male

genitalia are used in this study to recognize of the species; then Hensen (1987) complete this work, he revised the species under *Prosceliphron* subgenus.

Hensen (1988) revised of species under genus of *Chalybion* and organized identification key used many morphological characters; shaped of apical margin of clypeus, sculptures on lateral side of propodeum also characters of genitalia and shape of sternite 6 (S6) in male .

This study was suggested to recognize of the Sceliphrini species in Iraq by using many morphological characters especially male genitalia.

Materials and Methods

The adults of wasps (258 specimens) were collected by arial net throughout 1st March to 1st November 2010 and from 25 February to 1st August 2011 in different regions of Iraq and old specimens be got from Iraq natural history museum. The specimens are mounted and deposited in the Iraq natural history museum, the locality and date of collection were provided on the labels. The morphological terminology used herein follows that proposed by Bohart & Menke *(1976).* In preparation of genera and species keys are many publications modification to adequate the Iraq specimens (Bohart & Menke, 1963 and 1976; van der Vecht & van Breugel, 1968; Guichard, 1986 and 1988; Hensen, 1987; Roche & Gadallah, 1999)

The following morphological abbreviations are used: gasteral sternite (S), tergite (T), Pronotal collar (PC), scutum (S), scutellum (Sc) , metanotum (Mn), propodeum (P), tarsomere (t), upper metapleural area (Um), lower metapleural area (Lm), transverse metapleural line (Tm), lateral side of propodeum (LP) .

Taxonomy

Key to genera

1.Propodeum with U-shaped dorsal enclosure defined (Fig.1a); tarsi with plantulae (Fig.1b); body checkered by black and yellow colour (Fig.2a)…… ***Sceliphron*** Klug

- Propodeum without U-shaped dorsal enclosure; tarsi without plantulae; body metallic greenish-blue colour (Fig.4a, b) …… ***Chalybion*** Dahlbom

Genus ***Sceliphron*** Klug, 1801

***Sceliphron* Klug, 1801. N. Schrift. Berlin. Ges. Nat. Freunde, 3: 561.**

The black and yellow species of the genus *Sceliphron* are readily recognized by having the combination of a very long gasteral petiole composed of only S1, both recurrent veins received in submarginal cell 2 and U- shaped dorsal enclosure on the propodeum ,this genus widespread and builds mud nests in localities often associated with human dwelling, the tubular cells are mass provisioned with spiders (Roche, 2007); Guichard (1988) designed a key to some species of in Arabian peninsula depend on some morphological characters such as color of some parts, sculptures on mesopleuron and shaped of scutellum. The species: *Sc. pietschmanni* Kohl, *Sc. madraspatanum* Fab., *Sc. caucasicum* Andre. (=*Sc. arabs* Lepeletier), *Sc. tubifex* Latr. and *Sc. deforme* Smith was registered in Iraq by many faunastic lists (Beaumont, 1961; Derwesh, 1965 and Kaddou,1967)

Key to species of *Sceliphron*

Key to Males:

1-Tergite eight with anal cerci (Fig.2c); metapleuron granular and dull (Fig.2b); head of penis valve without apical process (Fig.2d) ……...***Sc. rectum*** Kohl

- Tergite eight without anal cerci; metapleuron smooth and shining (Fig.3a); head of penis valve with lateral apical process (Fig.3b) ……**2**

2- Hind coxae with angled margin on outer surface which are seen from above (Fig.3c); head of penis valve slightly shorter than stalk and semi-straight shaped (Fig.3b) ……..***Sc. arabs*** (Lepeletier)

-Hind coxae normally shaped or with rounded margin on outer surface which are seen from above (Fig.4a); head of penis valve clearly shorter than stalk and C-shaped (Fig.4b) ……..... ***Sc. madraspatanum*** (Fabricius)

Key to Females:

1.Metapleuron granular and dull, lateral surface of propodeum reticulate (Fig.2b); surface of six sternite keel shaped (Fig.2e)…… ***Sc. rectum*** Kohl

- Metapleuron smooth and shining, lateral surface of propodeum striated by thick and closely semi-vertical lines(Fig.3a); surface of six sternite normal or rounded shaped (Fig.3d)…… **2**

2- Hind coxae normally shaped or with rounded margin on outer surface which are seen from above (Fig.4a**)**…….. ***..Sc. madraspatanum*** (Fabricius)

-Hind coxae with angled margin on outer surface which are seen from above (Fig.3c) …… **3**

3-Mandibles with single tooth (Fig.3e); last half of scutum nearby admedian lines with high surface, scutellum bitubercles or clearly divided into two lobes by longitudinal median depression (Fig.3f)……..…***Sc. arabs*** (Lepeletier)

- Mandibles simple (Fig.4c); last half of scutum normal surface, scutellum usually simple or divided by simple longitudinal depression (Fig.4d) …….. …… ***Sc. pietschmanni*** (Kohl)

Sc. rectum Kohl, 1918

***Sceliphron rectum* Kohl , 1918. Ann. Naturhist. Hofmns. Wien. , 32:1-171**.

Materials (7♂♂,10♀♀):**Baghdad,** Tarmia:10.5.2010(1♂,2♀♀);20.5.2011(6♂♂, 8♀♀).

Distribution: Iran, United Arab Emirates, Arabia, Pakistan, India, newly recorded from Iraq.

Sc. madraspatanum (Fabricius, 1781)

Sphex madraspatana Fabricius, 1781. Spec. Ins., I:445.

Materials (60♂♂,43♀♀):**Baghdad**, Tarmia:2.4.2010(8♂♂,3♀♀), 15.5.2010 (3♂♂,2♀♀), 28.5.2010 (7♂♂,4♀♀),Jaddria: 27.6.2011 (6♂♂), Abu-Graib: (5♂♂,2♀♀); **Kerbela′a**, Ain Tamar :23.9.2010 (3♂♂,2♀♀); **Qaddissya,** Al-Shammyia : 25.2.2010 (2♂♂); **Wassit**, Al-Zubaidya: 28.4.2011 (2♂♂, 2♀♀), Sher′han: 15.7.2010 (3♂♂,3♀♀), 18.7.2010(6♂♂), 2.8.2010(3♂♂,2♀♀),5.8.2010(2♂♂),6.8.2010(1♂,2♀♀),21.4.2011 (2♂♂,2♀♀),29.5.2011 (2♂♂, 5♀♀), Sek'ran, 17.9.2010 (2♂♂, 2♀♀), 20.9.2010 (3♂♂, 2♀♀).

Distribution: SE. Asia, SW USSR, Arabia, Iran, Oman.

Sc. arabs (Lepeletier, 1845)

Pelopoeus arabs Lepeletier, 1845. Hist. Nat. Ins. Hym. , 3:309.

Materials (37♂♂,56♀♀): **Baghdad**, Tarmia:20.5.2011(6♂♂, 11♀♀), 29.5.2011(3♂♂, 7♀♀); Mahmodiya: 27.6.2011(3♂♂, 8♀♀); **Wassit**, Al-Zubaidya: 21.5.2010(11♂♂, 15♀♀),

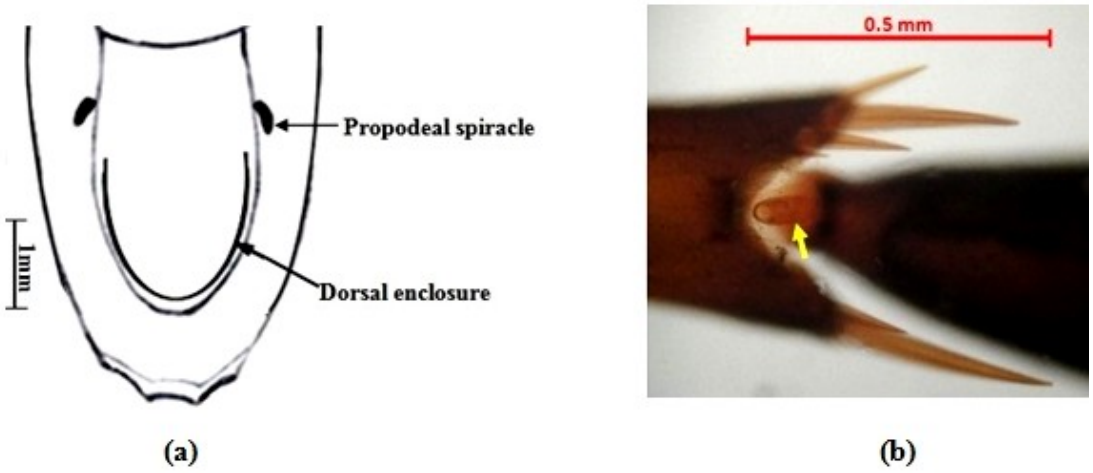

Figure (1) *Sceliphron* sp. a- dorsal surface of propodeum b-Plantula

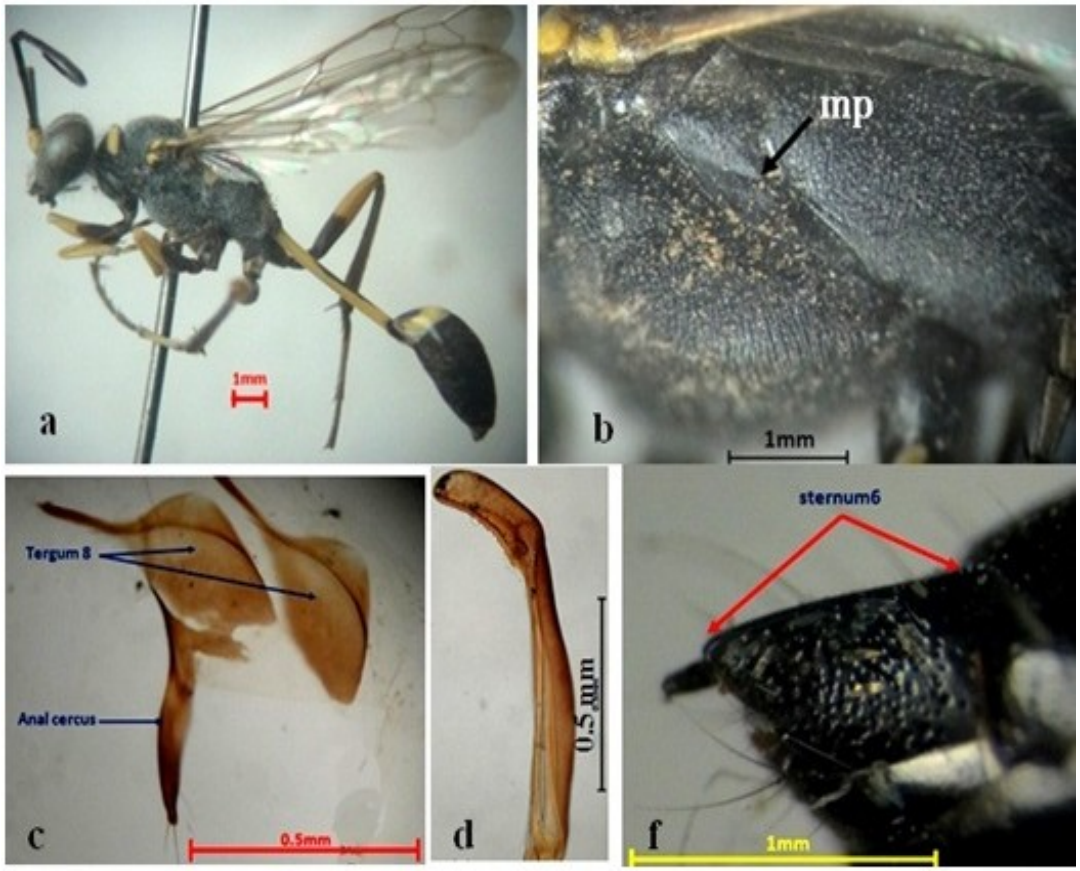

Figure (2) *Sc. rectum* (a) male (b)metapleuron of male (c)eighth tergum of male (d)penis valve (e) lateral side of female sixth sternite

Figure (3) *Sc. arabs* (a) metapleuron and lateral propodeum of male (b) penis valve (c) hind coxa of male (d) lateral side of female sixth stemite (e) anterior view of head in female (f) dorsal view of thorax in female

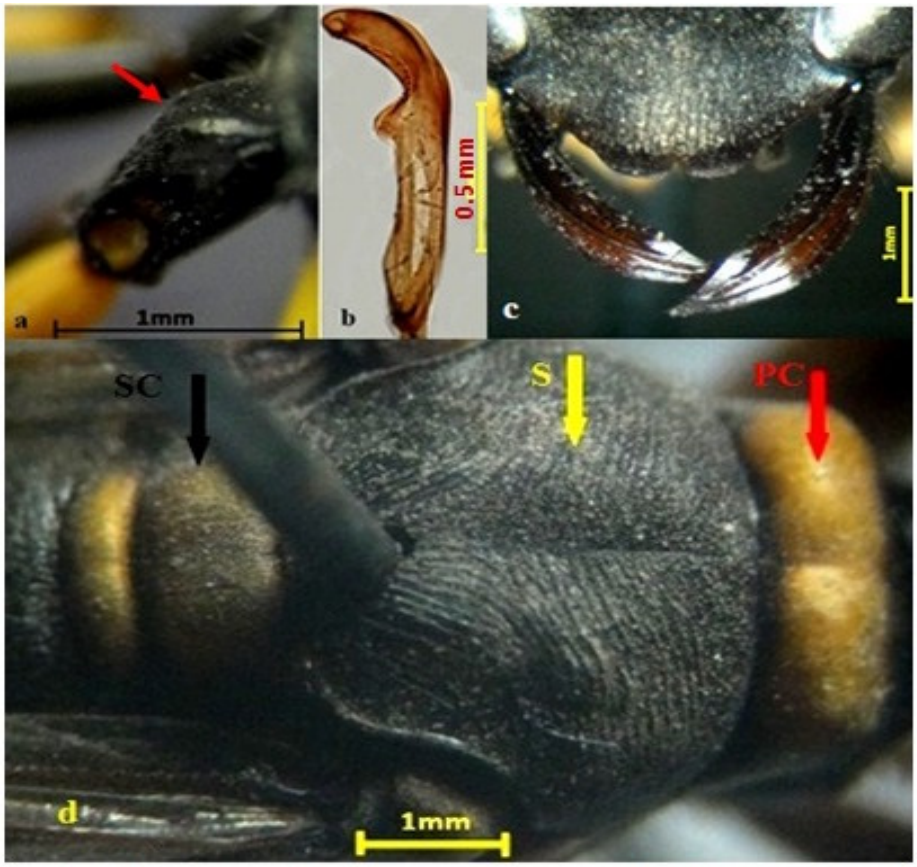

Figure (4) (a) hind coxa of *Sc. madraspatanum* in male (b) penis valve of *Sc. madraspatanum* (c) anterior view of head in female of *Sc. pietschmanni* (d) dorsal view of thorax in female of *Sc. pietschmanni*

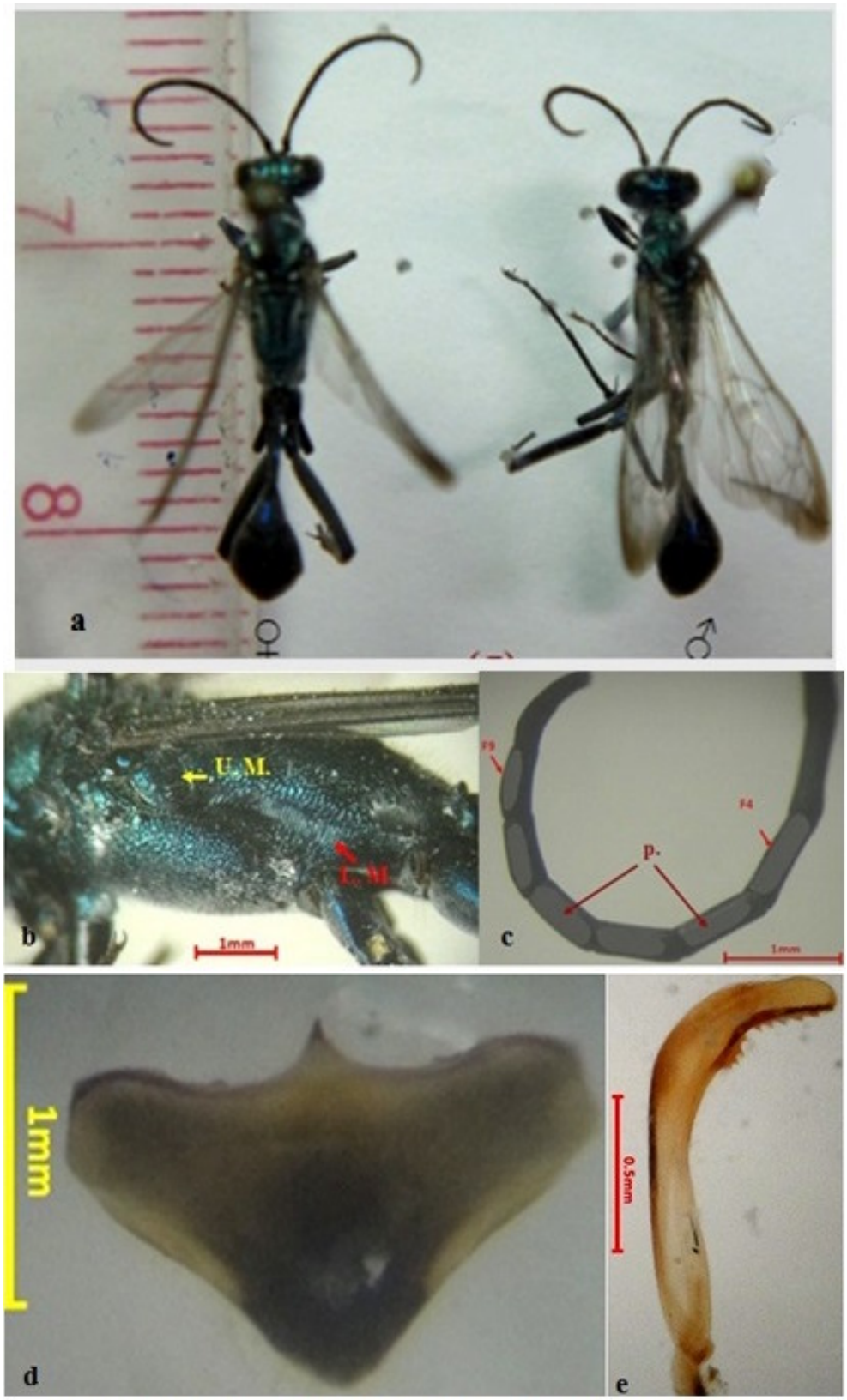

Figure (5) *Chalybion flebile* (a) male and female (b) lateral view of thorax in male (c) flagellomeres of male (d) eighth sternite of male

23.5.2010 (3♂♂,4♀♀), 28.4.2011 (5♂♂,7♀♀); **Erbil**, Berzzan, 10.4.2010 (4♂♂, 2♀♀); **Sulimania**, Bera Maq'ron Mountain, (2♂♂, 2♀♀).
Distribution: Turkey, USSR, Iran, Syria, SW. Asia.

Sc. pietschmanni Kohl, 1918
Sceliphron pietschmanni Kohl , 1918. Annln. Naturh. Mus. Wien., 32:15.
Materials (2♀♀): **Baghdad**: Abu-Graib 13.5.1986.
Distribution: Iraq, Iran.

Genus ***Chalybion*** Dahlbom**,** 1843
***Chalybion* Dahlbom , 1843 . Hymenopt. Europaea, I, 21.**
Genus *Chalybion* is metallic blue with a gasteral petiole composed of only S1, both recurrent veins received in submarginal cell 2 and without a dorsal enclosure on the propodeum; the genus widespread and its members nest in pre- existing cavities in walls, holes in woods or in abandoned mud nests of *Sceliphron* and provisioned with spiders (Guichard,1988; Roche, 2007). In Iraq this genus consists from two species; *Ch. flebile* (Lepeletier) (Guichard, 1988) and *Ch. bengalense* (Dahlbom) (Derwesh, 1965). The first species is registered only in present study. The male of *Ch. flebile* characterizes from male of *Ch. bengalense* by rounded ending of eight sternite (S8) contrast than acuminate ending in *Ch. bengalense* (Fig.5) (Hensen, 1988).

Ch. flebile (Lepeletier, 1845) ***Pelopoeus flebilis* Lepeletier, 1845.**

Hist. Nat. Insectes Hymenopt. 3:231.
Materials (18♂♂, 25♀♀): **Baghdad**: Tarmia, 3.4.2010 (2♂♂,3♀♀), 11.5.2010 (1♂,2♀♀), 28.5.2010 (3♂♂,5♀♀); **Wassit**: Al-Zubaidya, 21.5.2010(2♂♂,3♀♀), 22.5.2010(3♂♂,5♀♀), Sher'han, 27.5.2011 (4♂♂,2♀♀) ,29.5.2011 (2♂♂,2♀♀), 22.6.2011(1♂,3♀♀).
Distribution: Mediterranean region, Italy, Egypt, Israel, Oman, United Arab Emirates, Iran, Iraq, Syria.

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van der Vecht, J. & van Brugel, F. M. A. 1968. Revision of the nominate subgenus *Sceliphron* Latreille (Hymenoptera, Sphecidae) (Studies on the Sceliphronini, Part I). Tijdschrift voor Entomologie, 111:185-255.

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