Faunitaxys

Revue de Faunistique, Taxonomie et Systématique morphologique et moléculaire

Volume 8
Numéro 7

Mars 2020

ISSN : 2269 - 6016
Dépôt légal : Mars 2020

Faunitaxys

Revue de Faunistique, Taxonomie et Systématique morphologique et moléculaire

ZooBank : http://zoobank.org/79A36B2E-F645-4F9A-AE2B-ED32CE6771CC

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Elle est disponible librement au téléchargement à partir du site:
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La parution de *Faunitaxys* est apériodique

Imprimée sur les presses de SPEED COPIE
6, rue Tréfilerie, F- 42100 Saint-Etienne

Imprimé le 30 mars 2020

Onychogomphus (*Siriusonychogomphus*) *louissiriusi*, a new species and new subgenus from Thailand (Odonata: Anisoptera: Gomphidae)

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Keywords :

Odonata ;
Anisoptera ;
Gomphidae ;
Onychogomphinae ;
Onychogomphus ;
Siriusonychogomphus ;
louissiriusi ;
marijanmatoki ;
thienemanni ;
dragonfly ;
Southeast Asia ;
Thailand ;
Taxonomy ;
description ;
new species ;
new subgenus.

Abstract. – Based on reared larvae from Peninsular Thailand, the adult male and the adult female of *Onychogomphus louissiriusi* **n**. **sp**. are described and illustrated. This species is placed in *Siriusonychogomphus* **n**. **subg**. characterized notably by the combination of following characters: peculiar shape and disposition of larval antennae meeting for a long distance medially thus completely covering labrum and clypeus; unique triangular shape of larval frons; larval abdominal dorsal hook well developed only on second segment and directed anteriorly; hindwing lacking anal loop; vesica spermalis lacking flagellae and instead with pair of oreillets; prepuce rounded and not directed backwards; male caudal appendages strongly developed, of same length and not overlapping, with cerci almost straight in dorsal view, and with epiproct having closely appressed branches and bearing long molar ridge at base. Affinities with other species are discussed, the Bornean *Onychogomphus marijanmatoki* is considered possibly allied to this new species.

Fleck G., 2020. – *Onychogomphus* (*Siriusonychogomphus*) *louissiriusi*, a new species and new subgenus from Thailand (Odonata: Anisoptera: Gomphidae). *Faunitaxys*, 8(7) : 1 – 9.

ZooBank : http://zoobank.org/3498267A-45E8-4983-B745-C3579D813A06

Introduction

Some strange onychogomphine larvae identical to that described by Novelo-Gutiérrez & Che Salmah (2013) (under *Onychogomphus* sp.) were collected in a riffle section with gravelled bottom at low depth in a largely undisturbed forest stream close to confluence with the Sok river in Peninsular Thailand. Novelo-Gutiérrez & Che Salmah (2013) speculated that their *Onychogomphus* sp. larva could be *Onychogomphus duaricus* or *O. castor*, or possibly also a new species.

The successful rearing of F-0 larvae from Thailand led to the discovery of a new species most probably related to *Onychogomphus marijanmatoki* Dow, 2014 from Borneo. Larvae of *Onychogomphus duaricus* and *O. castor* have been recently described by Chainthong & Boonsoong (2016). They are, as most other onychogomphine unambiguously identified larvae, very different to that of species described here. A new subgenus is erected for the new species since it possesses a unique combination of adult and larval characters differentiating it from other subgenera of *Onychogomphus* and even from closely related genera.

Following Novelo-Gutiérrez & Che Salmah (2013) and Dow (2014) the new species is placed in the genus *Onychogomphus*, although future studies may change its status (see Dow, 2014).

The wing terminology follows Bechly (1996) amended by Fleck & Nel (2003) and Fleck et al. (2003), vesica spermalis terminology follows mainly that of Pfau (2011) except for the term "prepuce" used in the sense of Fraser (1940) and Carle (1986). Abbreviations: S1–S10, abdominal segments 1 to 10; FW, forewing; HW, hindwing; F-0, ultimate instar larva/exuvia. The drawings were made using a stereoscope MZ8 with camera lucida, and the photographs were taken using an Olympus TG4.

***Siriusonychogomphus* n. subg.**

ZooBank : http://zoobank.org/2273B228-A1F6-4D0C-A77E-7D5A4C3451BF

Type-species. – *Siriusonychogomphus louissiriusi* **n**. **sp**. by present designation.

Etymology. – The name is derived from Louis Sirius Fleck, son of the author, and from *Onychogomphus* generotype of the subfamily notably characterized by strongly developed caudal appendages.

Justification. – Carle (1986) asserted that "the subgenus *Onychogomphus* does not occur in China or India, the *Onychogomphus* of Chao (1954) being *Lamelligomphus* and the remaining *Onychogomphus* of Fraser (1934) being placed in the new subgenus *Nychogomphus*". Later, Chao (1991) based on vesica spermalis and male caudal appendages morphology erected the genus *Melligomphus* to receive some members of "*Onychogomphus*" attributed by Carle (1986) to *Lamelligomphus*.

– Using the key of Carle (1986), the new species herein described cannot be attributed to the subgenus *Onychogomphus* nor to the subgenus *Nychogomphus* because of conflicting characters used by Carle to define its subgenera. For example the new species has anterior hamuli bifurcate, cerci with apical third directed posteroventrally, anterior lamina low and not hood like, and distinct prepuce [moreover vesica spermalis structures are very different to that of *Onychogomphus forcipatus* and *Nychogomphus geometricus*, respective type species of those subgenera].

– The genus *Lamelligomphus* was proposed by Fraser (1924) [under *Lamellogomphus*] mainly based on a larva thought to be

Onychogompus biforceps nilgiriensis Fraser, 1922 that was very different from other known *Onychogomphus* larvae. This larva (illustrated in Fraser, 1922, Fig. a, p. 426) cannot belong to Onychogomphinae due to strongly flattened body, long and thin legs deprived of burrowing hooks or tubercles, and parallel wing pads (additionally the larva was collected in a pool with decaying vegetation, an atypical place for Onychogomphinae). This larva erroneously linked by Fraser to adults collected in the same locality almost certainly belongs to the genus *Heliogomphus* (belonging to subfamily Epigomphinae sensu Carle, 1986) as already mentioned by Lieftinck (1941). Thus, the imaginal generic diagnosis of *Lamelligomphus* was first essentially established on the shape of the male caudal appendages (Fraser, 1924) and later by that of the vesica spermalis (Fraser, 1940). As the new species presented in this paper has a very different vesica spermalis structure (V1 distinctly differently shaped, prepuce also clearly dissimilar and not backwards directed, V4 without flagellae) and different caudal appendages (epiproctal branches not separated at base and not largely overlapping the cerci), it cannot be included in *Lamelligomphus*. It is worth noting that larvae of the genus *Lamelligomphus* have since been described (Wilson, 1995; Chainthong & Boonsoong, 2016 – under *Onychogomphus*; see also Lieftinck, 1941 – larva of "*Onychogomphus*" *pollux*) and are of typical onychogomphine form.

– Following Chao (1991), the last closely allied genus to the *Onychogomphus*-complex is *Melligomphus*. This genus was defined uniquely by exclusion of two species from the genera *Nychogomphus* and *Lamelligomphus*, and its diagnosis was poorly formulated, Chao indicating simply "prepuce [present] on the middle segment of the penis and anal appendages elongate but not overlapping". These two characters are commonly found within Onychogomphinae and are probably not fully justifiable in defining a new genus (for example *Megalogomphus*, *Nepogomphus*, some *Orientogomphus*, and some Asian "*Ophiogomphus*", or, outside the Asiatic region, *Tragogomphus*/*Lybiogomphus* and *Nepogomphoides*, also have a prepuce and elongate caudal appendages not overlapping). Fortunately, the external morphology of the adult of *Onychogomphus ardens*, type species of *Melligomphus*, was detailed by Chao (1953) allowing easy comparison with the present new species. The new species can be excluded from the genus *Melligomphus* by, among others, the absence of anal loop in the HW, the absence ventrally on S2 of an elevated anterior lamina, the absence of flagellae on the vesica spermalis V4, by a prepuce not backwards directed, and by an epiproct strongly different (base not strongly curved ventrally, branches not separated at base, presence of a proximal long molar ridge).

– All known larvae of Onychogomphinae are generally similar and often no clearly cut characters allow for the separation of genera and subgenera. Consequently, the presence of markedly atypical larvae is a good indicator allowing to better define supraspecific taxa. This idea was followed by Fraser (1922) when he erected *Lamelligomphus* (see above). Later, Lieftinck (1941) emphasized that "a detailed study of the relationships of the various genera of the Gomphidae will have to be postponed until the larvae of more genera are known" and, citing Needham, that "it has long been apparent that some of the problems in the systematic arrangement of adult dragonflies might be helped toward a solution if more were known about their immature stages. This statement especially applies to Gomphine dragonflies, in the classification of which no one's proposals have as yet been very convincing". This was highlighted in the same paper by the illustration of the remarkable larva of the genus *Megalogomphus* leading Lieftinck to mention that "it differs very markedly from that of *Onychogomphus* and other members of the tribe in almost all important characters" and has "an appearance strikingly unlike that of other tropical gomphid larvae". The larva of *Siriusonychogomphus louissiriusi* **n. subg.**, **n. sp.** differs greatly from the majority of Gomphidae and cannot be confused with any known and positively identified Odonata larva and is easily distinguished due to the remarkable shape of antennae and frons and by the ornamentations of the abdomen.

As a consequence of all above cited elements, a new subgenus, *Siriusonychogomphus,* within *Onychogomphus* is established. It can be distinguished from all other subgenera of *Onychogomphus* and all genera of Onychogomphinae (sensu Carle, 1986) by its diagnosis based on larval and adult characteristics.

Diagnosis

- *Ultimate stadium larva*

1) insect of glabrous appearance, covered by fine granulation, and rather uniformly coloured (no distinct pattern of coloration in larvae, some small dots visible on pterotheca and abdominal tergites in exuviae) (Fig. 1);

2) remarkable organization of antennae forming a strong antennal "mask" firmly covering the entire labrum and clypeus (Fig. 2–3), with:

2a) scape and pedicel very stout, scape being about 2.2–2.5 times as broad as long,

2b) third antennomere enormously developed and scoop-shaped, exhibiting an irregular external surface with excavations and kind of slightly raised venules and low humps, presenting a development exclusively directed medially and ventrally, and with right and left antennomeres meeting medially thus hiding in frontal view the mouthparts,

2c) fourth antennomere apparently reduced to a low protuberance completely fused with third antennomere;

3) antefrons triangular (Fig. 2–3);

4) legs very short and strong with profemora about 2.2 times as long as wide and metafemora not reaching the middle of S4 (Fig. 1, 4);

5) pro- and mesothoracic legs with moderately developed burrowing hooks and with dorsolateral surface of tibiae covered by small tubercles (Fig. 2–3);

6) S2 dorsal hook well developed and anteriorly bent, remaining distal segments with dorsal hooks strongly reduced to inconspicuous bumps or absent (Fig. 1);

7) lateral spines extremely reduced (minute rounded spines possibly present on S7–9) or absent (Fig. 1);

8) presence of a pair of small triangular prepleurites on S8;

9) apex of epiproct distinctly rounded in dorsal view (Fig. 5–6).

Note: characters **3)** and **6)** are apparently unique within gomphid larvae.

- *Adults*

1) pair of broad, low and rounded tubercles behind lateral ocelli (Fig. 8);

2) occiput not inflated and deprived of cornicules or ornamentations (Fig. 8);

3) legs very short and strong, metatibia not longer than S4 (Fig. 7);

4) anterobasal angle of FW triangle acute (Fig. 10);

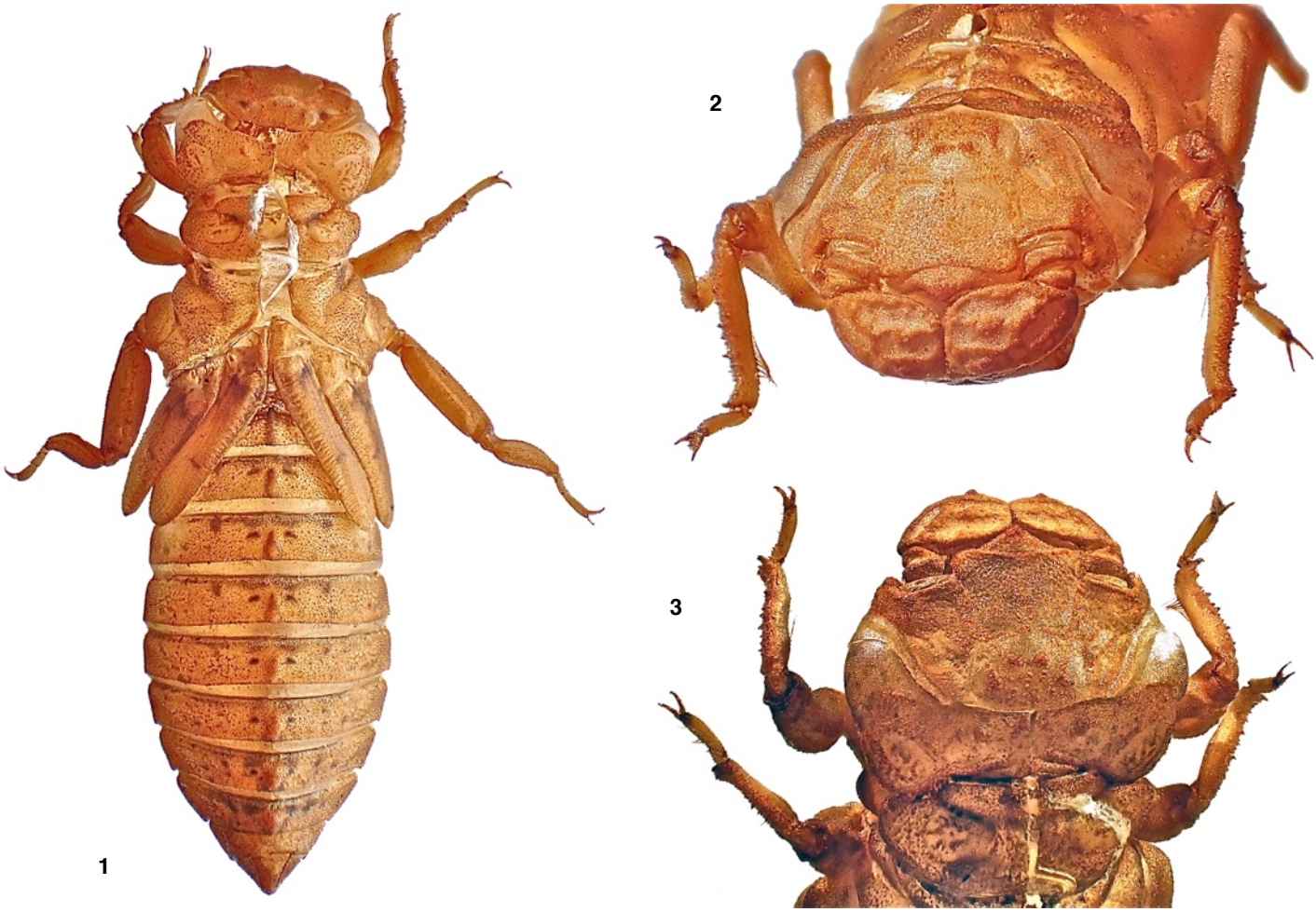


Fig. **1** - **3**. - *Onychogomphus louissiriusi* **n**. **sp**., last-instar exuviae.
– **1** : general habitus, dorsal view (paratype). – **2** : head, antero-dorsal view (holotype). – **3** : head, dorsal view (holotype).

5) FW arculus straight with posterior vein (closure) not perpendicular to MP+CuA (Fig. 10);

6) HW sectors of arculus separated by about 1/3 length of basal stem (Fig. 10);

7) HW MP and CuAa veins slightly divergent to posterior margin (Fig. 10);

8) S2 anterior lamina not inflated (Fig. 18);

9) anterior hamulus distinctly bifurcate with apical branch hooklike and directed posteriorly (Fig. 19);

10) vesica spermalis V1 with semicylindrical evagination having truncated and excavated apex (V4 receiver) (Fig. 18);

11) vesica spermalis V2 without hump (Fig. 18);

12) prepuce appearing as a large bulge entally directed (strongly perpendicular to the V3-V4 axis) and made by the fusion of the distal part of V3 and proximal part of V4 (Fig. 18, 20);

13) vesica spermalis lacking flagellae and instead with a pair of oreillets (Fig. 20–21);

14) male epiproct (inferior appendage) distinctly curved with branches elongate and contiguous (not separated at base and in close contact all over their length); with pair of long distinct proximal dorsal molar ridge; with, in lateral view, basal part being not at right angle or nearly so with longitudinal body axis, and dorsal margin strongly bent upward just distal to the molar ridge (Fig. 13–17);

15) male cerci (superior appendages) robustly built, in dorsal view very large at base, almost straight and meeting at apex in life; with a proximal dorsal carina ending distally at a small medio-dorsal rounded tooth; in lateral view, markedly arched and with, at the level of dorsal rounded tooth, ventral margin strongly curving ventrally (Fig. 13–16).

***Onychogomphus* (*Siriusonychogomphus*) *louissiriusi* n. sp.**

(Fig. 1–25)

ZooBank :http://zoobank.org/E400C778-8AB4-4D08-A85F-68BC75B51748

Material (all G. Fleck leg.)

Holotype, ♂. – Peninsular Thailand, Surat Thani Province, Bang Laen river close to the confluence with Sok river (8°54'52"N/98°31'34"E at ca 95 m above msl), F-0 larva 18.II.2017, reared adult emerged 30.VI.2017, placed in 95% ethanol eight days after emergence (fed), then air dried, exuvia dry stored.

Paratype, ♀. – Same data except emerged 08.VII.2017 (placed in ethanol seven days after emergence).

Paratype, *larva*. – One mature female F-0, same data, except placed in 95% ethanol 01.VII.2017.

Other specimen, *larva*. – One immature female F-0, same data, except placed in 95% ethanol 31.III.2017.

Type material will be deposited in a national institution housing insect collections.

Etymology. – Named after Louis Sirius Fleck son of the author for his 10th birthday.

Complement of F-0 larva description (Fig. 1, 5–6)

An excellent description was given by Novelo-Gutiérrez & Che Salmah (2013) (under *Onychogomphus* sp.).
A few additional data can be added: all larvae without distinct pattern of coloration, but exuviae (n=2) yellowish brown with some diffuse brown markings at base and nodus of pterotheca, with a pair of small dorsal spots on S3–9 and with a second pair of small dorso-lateral diffuse spots on S3–9 (reduced or indistinct on S7) (Fig. 1). Presence of a small ventral seta at distal 2/3–3/4 of claws. Male and female caudal appendages slightly different, with male anal pyramid very slightly longer, cerci slightly more developed and epiproct exhibiting a pair of thin lateral sutures (Fig. 5–6).

Description of adult male holotype (Fig. 7–21)

Small-sized gomphid; general body coloration black with citron yellow markings on head, thorax and abdomen (Fig. 7–9, 12).

Head (Fig. 8). – Labium mostly pale with darkened distal margins. Labrum mostly black with two subtriangular transversal yellow markings. Base of mandible and genae pale yellow. Anteclypeus dirty yellowish, becoming darker laterally, and with a pair of distinct dark oblong spots close to ventral margin. Antefrons black with a pair of large yellow spots. Postfrons, vertex and occiput black. Postocellar tubercles and dorsal occipital ridge covered by long black setae. Occipital ridge slightly biconcave in anterior view.

Thorax. – All legs almost entirely dark brown to black except procoxa and mesocoxa brown with some ill-defined yellowish brown traces and metacoxa brown with postero-lateral yellowish stripe (Fig. 7). Metafemora robustly built with ratio length/width ca 6.4. Prothorax almost dark brown to blackish with margin of anterior notal lobe and ventral margin of pleurite pale greyish. Synthorax black with pleural yellow markings as follows (Fig. 7, 9): marked collar stripes shortly interrupted by mesepisternal dorsal carina; antehumeral stripes narrow, largely separated from collar stripes and antealar ridge; mesepimeral stripe large occupying about ¾ of the mesepimeron, slightly narrowing dorsally; metepimeral spot large, occupying most of sclerite, bordered by a dark stripe ventrally and along metapleural suture, and partly interrupted by a narrow short dark line at dorsal suture; mesinfraepisternum with a small ventral yellowish brown spot and metinfraepisternum with a yellowish spot. Synthoracic dorsum dark with yellow markings as in Fig. 9. Wings (Fig. 10–11): hyaline with light and diffuse yellowish amber tinge at base and large proximal part of costal area, and inconspicuous and diffuse light smoke at apex; no basal subcostal crossvein; Ax1 and Ax2 separated by 3 crossveins of the first rank (between C and ScP) and 3 (left wings), 4 (right FW) and 2 (right HW) crossveins of second rank (between ScP and RA); FW antenodal crossveins of first rank distal to Ax2 7–8; FW antenodal crossveins of second rank distal to Ax2 9–10; HW antenodal crossveins of first rank distal to Ax2 4–5; HW antenodal crossveins of second rank distal to Ax2 4–5; postnodal crossveins 9–10; pterostigmata dark brown covering 4–5 cells; pterostigmatal brace present (left FW, right HW) or absent; sectors of arculus with 1 (right HW) or 2 crossveins before first split of RP; FW discoidal field with two rows of cells from origin to level of nodus; no clearly defined anal loop; three rows of cells between AA+CuA and HW posterior margin; anal triangle with 3 or 4 cells (the fourth cell of the right HW minute, Fig. 11); between posterior angle of anal triangle and tornus presence of some spines on external margin (Fig. 11).

Abdomen. – In dorsal view moderately broad at S1-2, narrowing on S3, from distal S3 to basal S7 relatively narrow and of about same width, expanding again from mid S7 to S10 (distal margin of S10 largest part of abdomen when S2 oreillets excluded) (Fig. 12). In lateral view S1-2 large, narrowing rapidly from distal S2 to basal S3, from mid S3 to basal S7 relatively narrow and of constant width, from S7 basal fourth to distal border of S10 strongly expanded (Fig. 7). Black to dark brown with yellow pattern as follows (Fig. 7, 12): S1 with a small triangular dorsal mark and with pair latero-ventral spots; S2 with dorsal longitudinal stripe, with pair distal latero-ventral trapezoidal spots and with yellow oreillets exhibiting dark narrow stripe along their lateral margin (Fig. 7, 10 & 18); S3 with a basal dorso-lateral band not interrupted medially; S4-6 with pair of small dorso-lateral spots; S7 with a pair of larger dorso-lateral spots occupying about basal third of segment; S8-10 and caudal appendages entirely black to dark brown. Distal margin of S10 with small median notch. Cerci and epiproct of about same length, the pointed apex of cerci almost meeting pointed apex of epiproctal branches (Fig. 13, 15). Basal dorsal elevation of the epiproct proximally with a lateral ridge distally forming a smooth molar tooth occupying a large part of dorsal surface of the branch (Fig. 14, 16). Cerci with marked dorsal and ventral carinae occupying respectively basal half and basal 2/3 (Fig. 16–17). Presence of a scanty fringe of fine setae on ventral margin of the cerci and some robust setae sparsely distributed on dorsal surface of epiproct (Fig. 13). Anal valves placed in a large ventral concavity of S10 (Fig. 17). Secondary genitalia: basal branch of anterior hamulus hook-like and directed anteriorly; posterior hamulus hook-like and directed anteriorly; vesica spermalis V3 short, about as long as large, distal ventral vesica V4 armed with a pair of small apposed horns and a pair of large oreillets (Fig. 18–21).

Measurements (mm)
– total length including caudal appendages 42.0;
– HW length 24.5;
– length of hind femur 4.5;
– width of hind femur 0.7;
– length of abdomen (including caudal appendages) 31.2;
– length of caudal appendages 3.1.

Description of adult female paratype (Fig. 22–25)

Adult female resembling holotype male differing by the following:

Smaller size but of more robust appearance due to shorter and somewhat broader abdomen (Fig. 22).

Head (Fig. 23). – Labial palps nearly entirely greyish to dark greyish. Yellow markings of labrum slightly larger. Presence of a pair of small yellow spots on postclypeus.Yellow markings of the frons more greatly separated medially and nearly reaching the clypeo-frontal suture. Biconcavity of occipital ridge slightly better marked (medial prominence slightly more distinct).

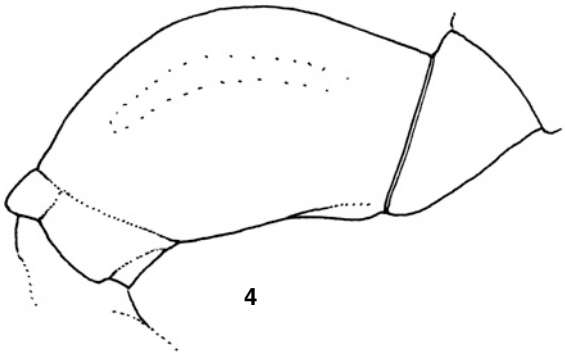
Thorax. – Mesepimeral stripe slightly larger. Metatibia slightly less robust with ratio length/width ca 7.0, and with spines slightly stronger. Wings (Fig. 24): FW antenodal crossveins of first rank distal to Ax2 9; HW antenodal crossveins of first rank distal to Ax2 5–6; HW antenodal crossveins of second rank distal to Ax2 5–6; postnodal crossveins 8–9.

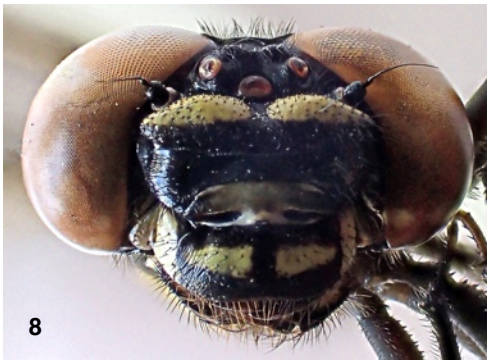
Abdomen (Fig. 22, 25). – S2 oreillets present but reduced to small protuberances. S2 with only one large lateral rectangular yellow marking; S3 dorso-lateral markings larger and separated dorsally; S4–6 dorso-lateral spots slightly larger. S9 genital plate placed in a cavity made by S9 lateral development of tergites and distally down curved sternite, with vulvar lamina triangular, this last with short V-shaped cleft at apex, long longitudinal suture, and occupying about proximal 0.6 of S9 sternite (Fig. 25). Epiproct lacking basal spine. Cerci robust, pointed, and as long as S10.

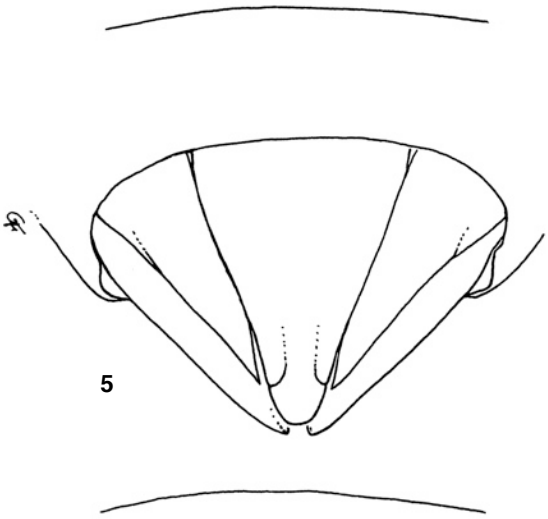
Measurements (mm)
– total length (with caudal appendages) 35.5;
– HW length 23;
– length of hind femur 4.2;
– width of hind femur 0.6;
– length of abdomen including caudal appendages 27.4.

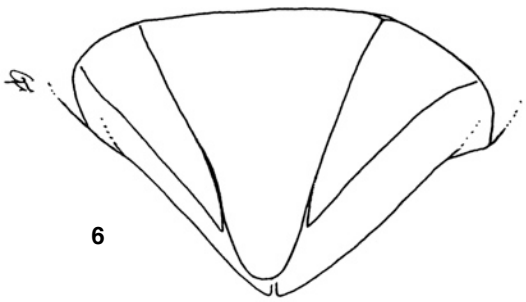
Discussion

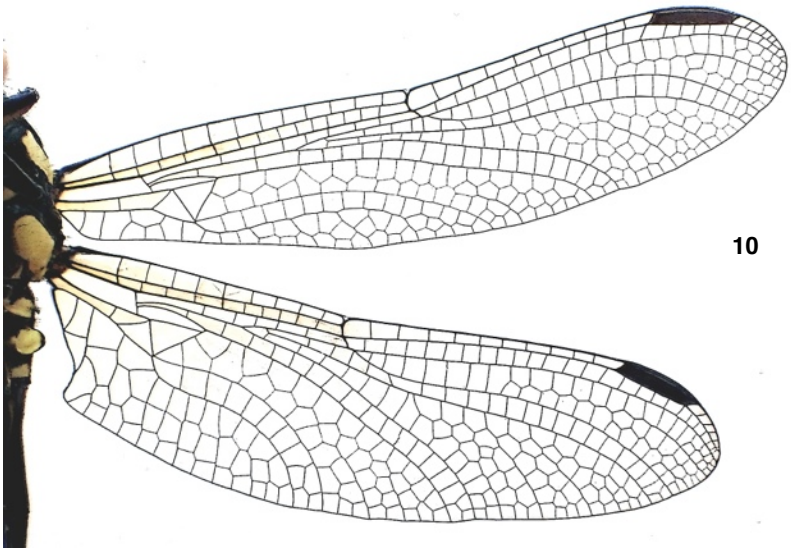
Onychogomphus (*Siriusonychogomphus*) *louissiriusi* **n. sp.** by adult pattern of coloration, shape of male secondary genitalia, and male caudal appendages is a well defined taxon and should not be confused with any other onychogomphine species. Its remarkable larva should also be unambiguously identified within Gomphidae. Fraser (1933) described *Onychogomphus kerri* (according to Schorr & Paulson, 2020) based on a single female from Thailand. This species can be easily separated











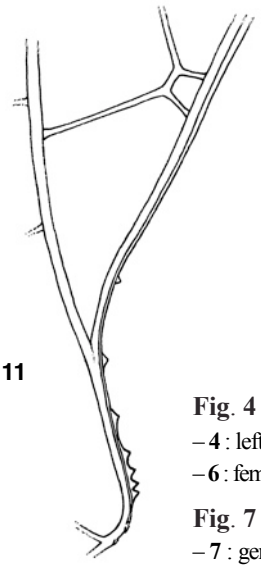


Fig. **4 - 12**. - *Onychogomphus louissiriusi* **n**. **sp**.

Fig. **4 - 6**. Last-instar larvae.

– **4** : left profemur in lateral view (holotype). – **5** : male anal pyramid in dorsal view (holotype), dorsal anterior margin of segment 10 is figured. – **6** : female anal pyramid in dorsal view (with very slight right lateral component) (paratype exuvia), dorsal anterior margin of segment 10 is figured.

Fig. **7 - 12**. Male (holotype).

– **7** : general habitus in left lateral view. – **8** : head in frontal view. – **9** : thorax and first segments of abdomen in dorsal view. – **10** : left pair of wings in ventral view. – **11** : base of right hind wing showing anal angle and part of anal triangle, ventral view. – **12** : abdomen in dorsal view .

from *O. louissiriusi* **n**. **sp**. by its yellow occiput having small tubercles, yellow legs, thoracic yellow collar stripes in contact with antehumeral stripes, vulvar lamina truncated at apex, and epiproct with a basal spine. The taxonomic validity of *O. kerri* is debatable since 1) Fraser indicates only that he was "inclined to treat" the specimen as new species, the full description and all comments being under the heading "Onychogomphus saundersii, Selys ?", 2) p. 111, under the label "List of Species of Dragonflies from the Laos Country" nothing is indicated concerning *O. kerri*, and again only appears "*Onychogomphus sp., saundersii* Selys ?"; thus *O. kerri* was not formally named by the author. Later, Kimmins (1966, p. 199) listed the lectotype of *Onychogomphus saundersi kerri* in the British Museum, treating the taxon as a subspecies.

Affinities of *O. louissiriusi* **n**. **sp**. with other species have not been easy to establish due to the lack of global onychogomphine revision and phylogeny, and difficulties to access to some characters and to some species; thus to try to get taxa related to the new species a comparative study of wing venation, shape of secondary genitalia and caudal appendages was made using material available, literature, internet resources and personal communications with some specialists of Asian odonatofauna. *Onychogomphus marijanmatoki* Dow, 2014 from Borneo exhibits a similar wing venation, the male caudal appendages are structurally similar though moderately different, and there are some similarities in the vesica spermalis such as identical V1 and absence of flagellae. The thoracic pattern of coloration is also almost identical in both species. However *O. marijanmatoki* does not have a developed prepuce and the branches of epiproct are separated, slightly divergent, and lack the molar part on the basal carina. I consider this species possibly related to *O. louissiriusi* **n**. **sp**. The discovery of the larva of *O. marijanmatoki* should be of great value to better define affinities of this species.

All gomphid larvae thus far described are all strongly different to that of *O. louissiriusi* **n**. **sp**. except one attributed to *Onychogomphus thienemanni* by Novelo-Gutiérrez & Che Salmah (2013). The attribution to *O. thienemanni* was made on the basis of a very mature larva containing a pharate adult which made possible specific identification by the thoracic color pattern and male caudal appendages. Considering the extreme difficulty in unambiguously identify mature larva specifically using the fragile and non inflated caudal appendages of pharate adult inserted in larval skin (pers. obs.), and considering that *O. thienemanni* has similar thoracic pattern of coloration to that of some other onychogomphine such as *Acrogomphus*, *Lamelligomphus*, *Melligomphus*, Asian "*Ophiogomphus*" (sensu Karube, 2014), and Asian "*Onychogomphus*" (the poorly known *O. marijanmatoki* has thoracic color pattern and caudal appendages similar to *O. thienemanni* and its larva remains unknown), and finally considering the possibility of still undescribed taxa, the attribution of larvae to *O. thienemanni* by Novelo-Gutiérrez & Che Salmah should be considered as only probable. Successful rearing or DNA link is necessary for an unambiguous attribution. The supposed larva of *O. thienemanni* shares with *O. louissiriusi* **n**. **sp**. nearly identical antennae and reduced abdominal dorsal hooks and lateral spines, and the adult has comparable wing venation (see Orr, 2005), similarities also exist in the caudal appendages even if somewhat different, and apparently resemble vesica spermalis V1 (see Schmidt, 1935: Fig. 79-80). The knowledge of the apex of the vesica spermalis of *O. thienemanni* and confirmation of larval attribution would be of great help to better define affinities of this species, nevertheless it cannot be excluded that it is related to *O. marijanmatoki* and to *O. louissiriusi* **n**. **sp**.

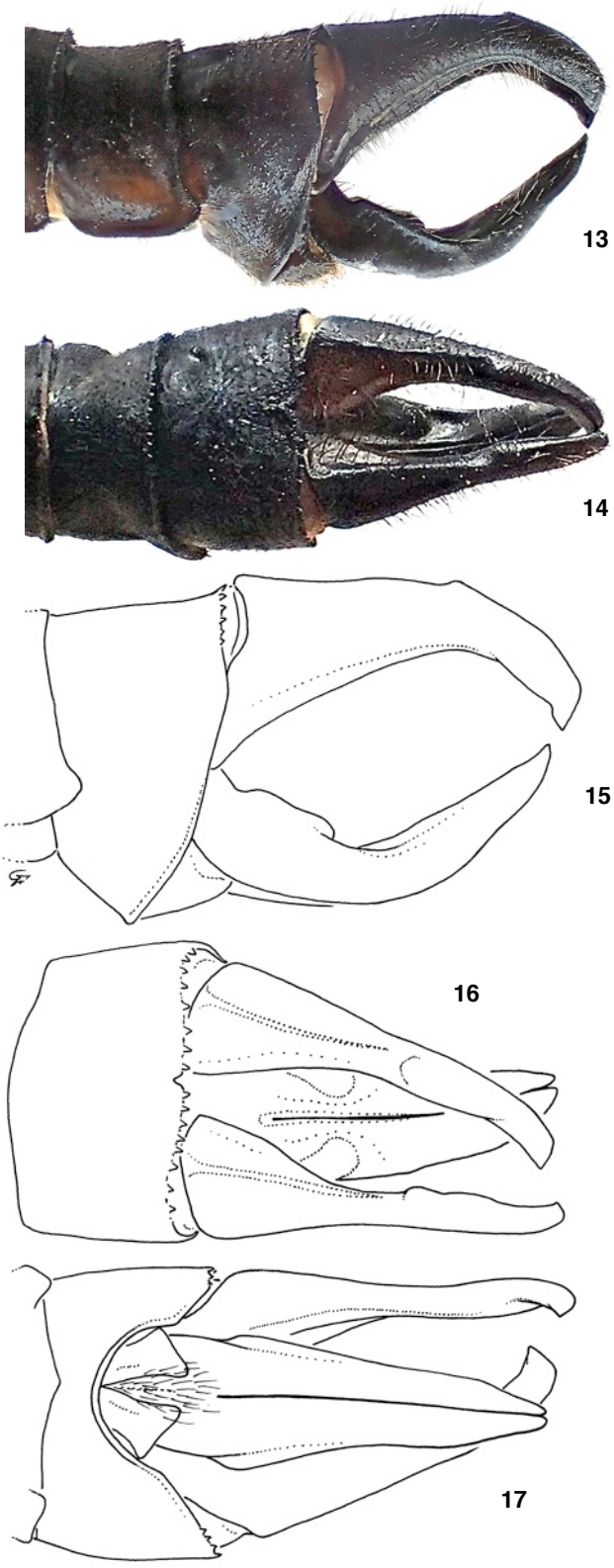


Fig. **13** - **17**. - *Onychogomphus louissiriusi* **n**. **sp**., male caudal appendages and last abdominal segments (holotype).

– **13** : left lateral view. Note the light fringe of fine setae on ventral margin of the cerci and the more robust setae sparsely distributed on dorsal surface of epiproct.
– **14** : dorsal view with slight left lateral component. Note the dorsal carina of the cerci and the dorsal surface of right branch of epiproct showing part of the basal elevation.
– **15** : left lateral view.
– **16** : dorsal view with slight left lateral component. Cerci in artificial position allowing to show the different structures of the caudal appendages.
– **17** : ventral view with slight right lateral component. Cerci in artificial position.

Several Asian "*Onychogomphus*" are in need of a revision. As some of them exhibit somewhat similar caudal appendages with *O. louissiriusi* **n**. **sp**. (see for example Fraser, 1934), they could be related to this species. Studies integrating molecular analysis and/or a fine study of the secondary genitalia, male caudal appendages as well as a better knowledge of larvae should improve our knowledge on taxonomy and phylogeny of Onychogomphinae.

Acknowledgments

I would like thank R. Dow and O. Kosterin for their help and fruitful discussions, R. Garrison for improvement of the language and comments, L. Juillerat for proofreading, and N. Makbun for his view.

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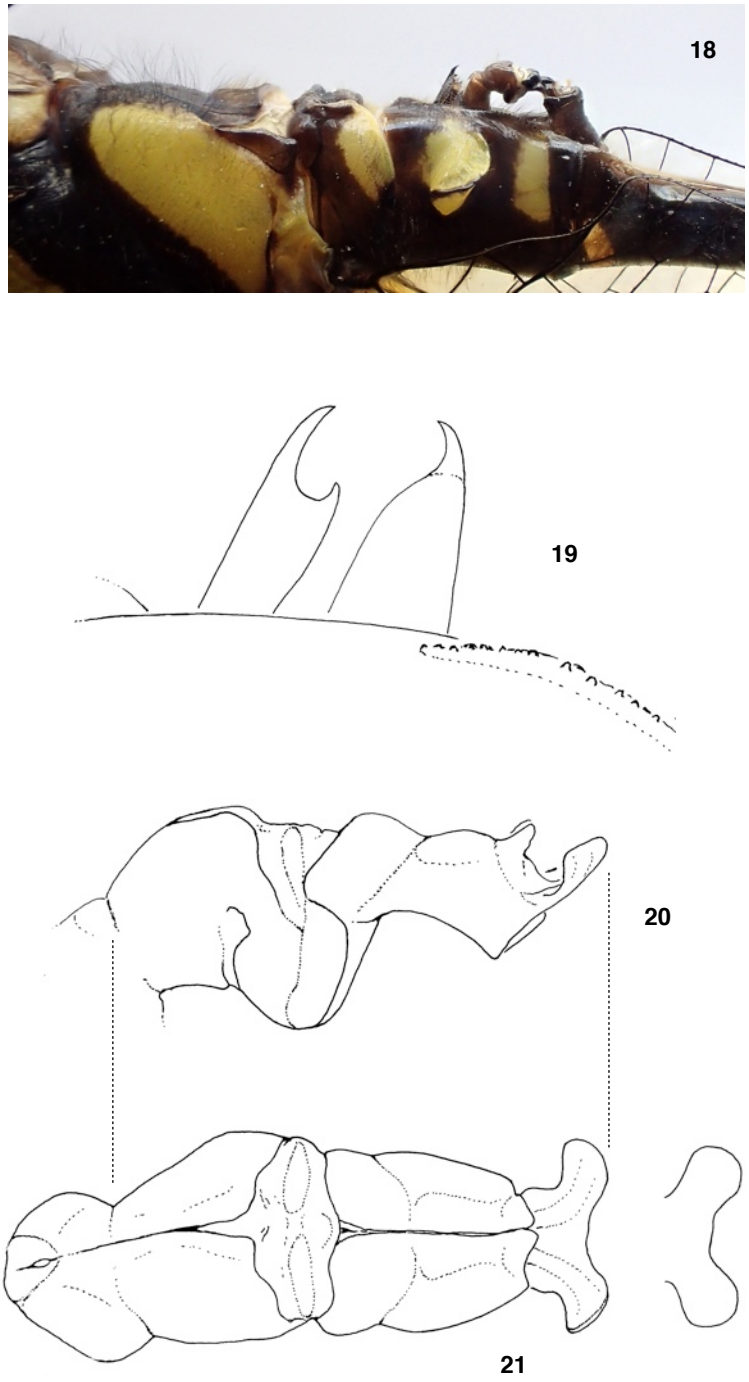


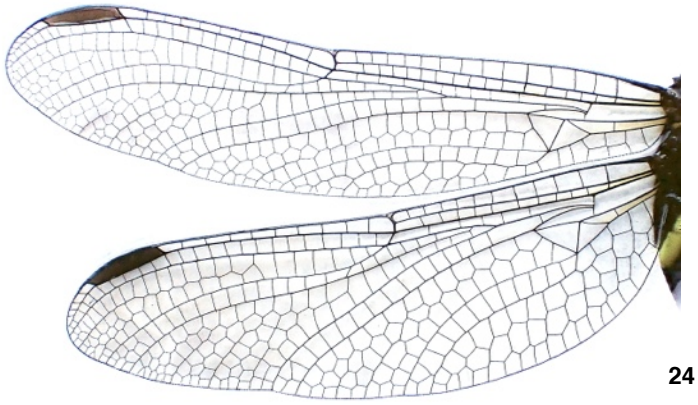
Fig. **18 - 21**. - *Onychogomphus louissiriusi* **n**. **sp**., male (holotype).

– **18** : secondary genitalia, first abdominal segment and part of metathorax in lateral view. Posterior hamuli artificially bent in copula position to better expose last segments of the vesica spermalis.

– **19** : hamuli in natural position at rest, right lateral view. Setae omitted.

– **20** : two last segments of the vesica spermalis in right lateral view.

– **21** : three last segments of the vesica spermalis in dorsal view, and detail of the apical oreillets in view perpendicular to their flat surface.



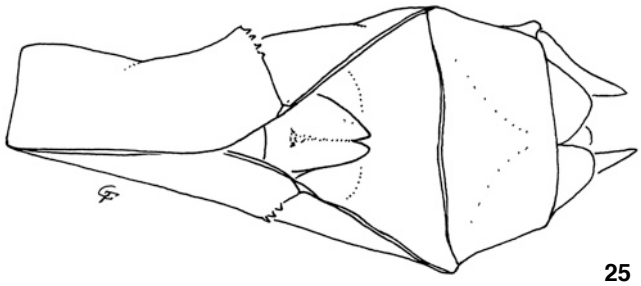


Fig. **22 - 25**. - *Onychogomphus louissiriusi* **n**. **sp**., female (paratype).
– **22** : General habitus in left lateral view.
– **23** : Head in frontal view.
– **24** : Right pair of wings in ventral view.
– **25** : Last abdominal segments in ventral view with slight left lateral component.

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Résumé

Fleck G., 2020. – *Onychogomphus* (*Siriusonychogomphus*) *louissiriusi*, espèce nouvelle et sous-genre nouveau de Thaïlande (Odonata : Anisoptera : Gomphidae). *Faunitaxys*, 8(7) : 1 – 9.

L'élevage de larves de Thaïlande péninsulaire permet de décrire les adultes mâle et femelle d'*Onychogomphus louissiriusi* **n**. **sp**. Cette espèce est placée dans *Siriusonychogomphus* **n**. **subg**. caractérisé notamment par : la forme et la disposition des antennes larvaires, jointives sur une longue distance le long du plan sagittal et formant une sorte de robuste masque recouvrant entièrement labre et clypéus ; la forme triangulaire unique du front larvaire ; une épine dorsale bien développée uniquement sur le second segment abdominal larvaire et remarquablement dirigée vers l'avant ; l'aile postérieure sans boucle anale ; une vesica spermalis sans flagelles, remplacés par une paire d'oreillettes ; un prépuce arrondi et non dirigé vers l'arrière ; des appendices anaux du mâle fortement développés et courbés, ne se chevauchant pas, avec les cerques sub-rectilignes en vue dorsale, et avec l'épiprocte ayant les branches jointives portant chacune à sa base, côté dorsal, une longue crête émoussée. Les affinités de cette espèce avec d'autres sont discutées, *Onychogomphus marijanmatoki* de Bornéo pourrait-être apparenté à cette nouvelle espèce.

Mots-clés. – Odonata, Anisoptera, Gomphidae, Onychogomphinae, *Onychogomphus*, *Siriusonychogomphus*, *louissiriusi*, *marijanmatoki*, *thienemanni*, libellule, Asie du Sud-Est, Thaïlande, taxonomie, description, espèce nouvelle, nouveau sous-genre.

Fig. **26**. - Bang Laen stream, locus typicus of *Siriusonychogomphus louissiriusi* **n**. **sp**., crossing dense rainforest little perturbed by human activity.

Fig. **27**. - The large Sok stream a short distance downstream of the confluence with the more modest Bang Laen stream. *Siriusonychogomphus louissiriusi* **n**. **sp**. was not encountered in this wider river.

Faunitaxys

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Illustration de la couverture : Rivière Bang Laen, Province de Surat Thani, Thaïlande. Localité type d'*Onychogomphus* (*Siriusonychogomphus*) *louissiriusi* **n**. **subg**., **n**. **sp**.

Cover photo: Bang Laen river, Surat Thani Province, Thailand. Type locality of *Onychogomphus* (*Siriusonychogomphus*) *louissiriusi* **n**. **subg**., **n**. **sp**.

Publié par l'Association Française de Cartographie de la Faune et de la Flore (AFCFF)