

# Description of *Rheotanytarsus langtoni* sp. n. from the Rif of north-western Morocco [Diptera, Chironomidae, Tanytarsini]

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Male adult of *Rheotanytarsus langtoni* sp. n. is described based on material collected in lotic habitats delimited by the upper stream of Farda Wadi (Rif, north-western Morocco). The new species belongs to the *guineensis*-group, which comprises 19 species mostly known from Europe and Africa. It closely resembles *R. procerus* Reiss, 1991 based on some common characters found in the male adult (shape of both anal point in dorsal and lateral view and the superior volsella). In addition, the pupal exuviae of *R. procerus* is briefly redescribed and illustrated and parts of the male adult are figured. The description of *R. langtoni* sp. n. increases the total number in the genus *Rheotanytarsus* to 12 species from Morocco. *R. langtoni* sp. n. is only known from the upper stream of the mountainous Farda Wadi, which is considered to be a local cold refuge. Such refuges include biological indicators species of global warming and climate change in this biogeographical region. Taxonomic remarks on some related species, key to known species from the Moroccan Rif with comments on the ecology and geographical distribution of the new species are provided.

## Description de *Rheotanytarsus langtoni* sp. n. du Rif Marocain [Diptera, Chironomidae, Tanytarsini]

Mots-Clés: *Rheotanytarsus langtoni* sp. n., Diptera, Chironomidae, Parc National de Talassemtane, Rif, NW-Maroc, conservation.

Le mâle adulte de *Rheotanytarsus langtoni* sp. n. est décrit à partir d'un matériel collecté dans des habitats lotiques le long du cours supérieur de l'Oued Farda (Rif, NW-Maroc). La nouvelle espèce appartient au groupe *guineensis* qui comprend 19 espèces essentiellement connues d'Europe et d'Afrique. L'espèce nouvelle ressemble étroitement à *R. procerus* Reiss, 1991 sur la base de certains caractères morphologiques de l'imago mâle (forme de la pointe anale en vue dorsale et latérale et celle de la volselle supérieure). D'autre part, une redescription sommaire de l'imago mâle et de l'exuvie nymphale de *R. procerus* est également présentée. La présente description porte à 12 le nombre d'espèces du genre *Rheotanytarsus* connues du Maroc. *R. langtoni* sp. n. n'est connue, jusqu'à présent, que du bassin supérieur montagneux de l'Oued Farda qui est considéré comme un refuge local où sont confinés des indicateurs biologiques du réchauffement climatique global dans cette région biogéographique. La position systématique est discutée, avec des clés d'identification se rapportant aux adultes mâles. L'écologie et la distribution géographique de la nouvelle espèce sont également commentées.

## 1. Introduction

The genus *Rheotanytarsus* Thienemann & Bause, 1913 is recorded from all zoogeographical regions except Oceania and Antarctica (SÆTHER & SPIES 2013). Data on the taxonomy, geographical distribution and ecology of the genus *Rheotanytarsus* worldwide (e.g. FITTKAU 1960, LEHMANN 1970, 1979, 1981, SHILOVA 1976, CLOUTIER & HARPER 1986, CRANSTON et al. 1989, MOUBAYED 1989, 1990, REISS 1991, WANG & ZHENG 1993, CHAUDHURI et al. 1994, LANGTON & ARMITAGE 1995, CRANSTON 1997, KYEREMATEN & SÆTHER 2000, KYEREMATEN et al. 2000, ANDERSEN & KYEREMATEN 2001, SÆTHER & KYEREMATEN 2001, KYEREMATEN & ANDERSEN 2002, BURMEISTER & REISS 2003, WANG & GUO 2004, LANGTON & PINDER 2007, GILKA 2011, MOUBAYED-BREIL et al. 2012) show that there are about a hundred species described including 16 currently reported from Europe and 13 from North Africa. The latter list of 13 *Rheotanytarsus* species was given in MOUBAYED-BREIL (2008). In particular the species recorded as *Rheotanytarsus* sp. 1, from Morocco, in KETTANI & MOUBAYED-BREIL (2018) is new for science and is described here below: *Rheotanytarsus langtoni* sp. n.

The material was collected in the rhithral of the upper stream of Farda Wadi (Rif, north western Morocco) using a Malaise trap supplemented by aerial sweep netting. Terminology and measurements follow those of SÆTHER (1980, 1985) for the imagines, and LANGTON (1991) for the pupal exuviae.

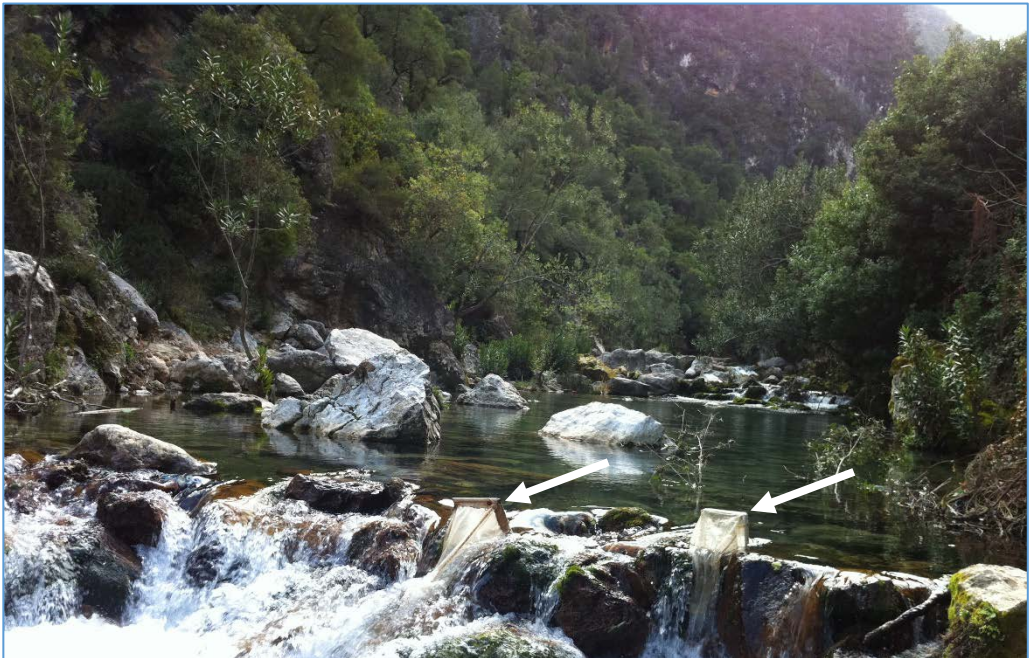


Photo 1. Farda Wadi basin (rhithral, arrows: location of two drift nets): type locality of *Rheotanytarsus langtoni* sp. n. Photo K. Kettani 09.03.2012.

Photo 1. Bassin de l'Oued Farda (rhithral, flèches : emplacement de deux filets de dérivation): localité type de *Rheotanytarsus langtoni* sp. n. Photo K. Kettani 09.03.2012.

## 2. Studied sites

The investigated area corresponds to the Rifian chain (called the Rif), which includes the most mountainous region of northern Morocco. The Rif is bordered by the Mediterranean Sea to the north, Algeria to the east and the Atlantic Ocean to the west. The maximum altitude is 2452 m on the Jbel Tidirrhine. The Rif belongs to the Gibraltar Arc or Alborán Sea geological region, part of the Alpine orogenic belt. The climate is mainly of Mediterranean type and is characterised by high levels of precipitation and drainage, with an average annual rainfall and soil drainage above 1100 mm. The watercourse regime is often intermittent or even dry. Some rivers operate only after abundant and continuous rains. Torrential flows are often reported in the area. Most of the investigated temporary streams lie in small catchment basins. In this diverse Rifain context, a multitude of coastal watersheds extend along the Mediterranean coast: Fnideq at the west to Saïdia, high peaks of the Rif at the east. The collection sites include 37 localities (31 aquatic and 6 terrestrial), which were investigated between 1991 and 2016. The various sites are covered by three broad biogeographic areas: the Western Rif with 14 sites, the Central Rif with 22 sites and the Eastern Rif with 7 sites. The Central Rif, the most diverse part of the Rifian massif, is regarded as the most original entity, with respect to the local floral diversity. More details about the description of the sampling sites are provided in KETTANI & MOUBAYED-BREIL (2018).

## 3. Descriptions

### *Rheotanytarsus langtoni* sp. n.

#### Material examined

Holotype. Morocco, Rif, karstic spring and rhithral, upper basin of Lawu Wadi, Farda Wadi (Photo 1), Province of Chefchawen (35.237379 N; -5.176027 W); altitude 500-600 m, 1 male pharate adult, leg. K. Kettani, 09.III.2012. Environmental data: calcareous water, conductivity 476  $\mu$ S/cm; pH 7.9; dissolved oxygen, 5.9 mg/L; temperature (mean 10.9 °C).

Paratypes (leg. K. Kettani). 1 male adult, same locality and data.

Holotype (male adult, on one slide) is deposited in the collections of the National Museum of Ireland, Kildare Street, Dublin 2, Ireland. The single paratype is deposited in the senior author's collection.

Type material was preserved in 80% alcohol, and later mounted in polyvinyl lactophenol. For each adult, the head, thorax and abdomen were cleared in 90% lactic acid then washed in 70% ethanol before mounting on slides.

#### Diagnostic characters

Based on the resemblance of some primary characters found in the male adult of *R. procerus* and *R. langtoni* sp. n. these two species are considered to be sister species. However the new species can be easily distinguished by the following characters: hairs present on proximal part of inner margin of eyes; tergite IX with 4 dorsal setae located between the anal tergite bands (ATB) and crest of anal point; anal point with pointed apex; superior volsella longitudinally elongated, wide at base and narrowed distally to end with a distinct hook-shaped apex, digitus absent; stem

of median volsella nearly reaching tip of superior volsella, markedly bi-lobed apically, differentiated setae lamelliform, parallel-sided proximally, but curved and setae-like apically; inferior volsella reaching half length of gonostylus, setiferous ventral lobe with 3 setae located close one to another.

**Etymology:** the new species is named “*langtoni*” in honour of the eightieth anniversary of our colleague Dr Peter H. Langton who remains active as a taxonomist in contributing to preserving the environment and aquatic habitats in both England and Ireland.

### Male imago

(n = 2, male adults; Figs 1, 3, 5, 7-11)

-*Rheotanytarsus* sp. 1, known from the Moroccan Rif (KETTANI & MOUBAYED-BREIL 2018)

A medium sized *Rheotanytarsus* species. Total length about 1.95 mm. Wing length 1.40 mm. TL/WL 1.39. Colouration yellow brown to dark brown with contrasting light brown to dark brown scutal thoracic strips. Head, legs and abdominal segments brownish, apex of tibia of PII-PIII blackish including spurs, anal segment contrasting brown to dark brown.

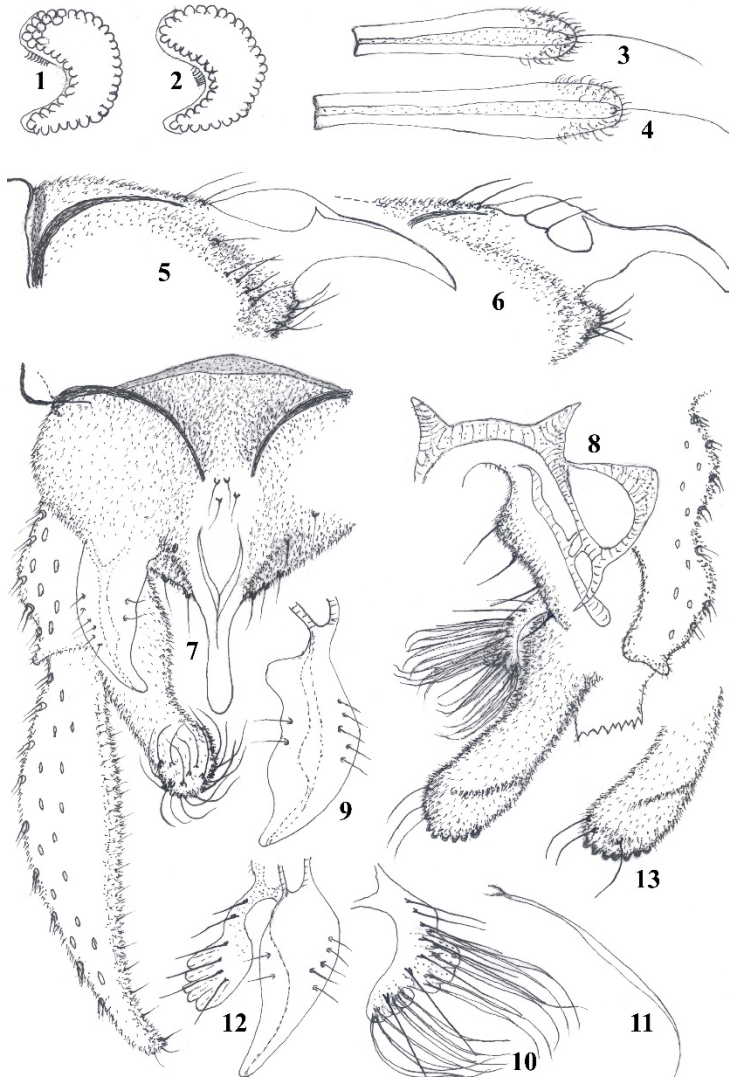
Head. Eyes bare; hairs present between ommatidia on proximal part of inner margin of eyes (Fig. 1); frontal tubercles absent. Temporal setae 10 including 7 inner and 3 outer verticals. Clypeus sub-rectangular with about 12 setae in 3-4 rows. Palp 5-segmented, segments 1-2 fused; length (in  $\mu\text{m}$ ) of segments 3-5: 25, 35, 45, 85, 115. Antenna 13-segmented, 550  $\mu\text{m}$  long, ultimate flagellomere (Fig. 3) 140  $\mu\text{m}$  long, weakly clubbed and bearing 1 distinct apical seta 50-55  $\mu\text{m}$  long; antennal groove reaching segments 1-2; AR 0.34.

Thorax. Lobes of anteprenotum widely separated; anteprenotals absent; acrostichals 11-12 in 1-2 rows; dorsocentrals 12; prealars 1-2. Scutellum with 8 setae located in 1 row. Wing. Brachium with 2 setae; membrane heavily pubescent, all veins densely hairy except for M. Squama bare. Legs. Tibial combs of PII and PIII well separated with nearly sub-equal teeth; length (in  $\mu\text{m}$ ) of tibial spurs: PI, 15; PII-PIII, 15 each; tarsomeres  $\text{ta}_1$ - $\text{ta}_3$  of PII with few sensilla chaetica, apparently 3 are present on  $\text{ta}_1$ . Length ( $\mu\text{m}$ ) and proportions of prothoracic (PI), mesothoracic (PII) and metathoracic (PIII) legs:

	fe	ti	ta <sub>1</sub>	ta <sub>2</sub>	ta <sub>3</sub>	ta <sub>4</sub>	ta <sub>5</sub>	LR	BV	SV	BR
PI	550	390	260	145	110	70	60	0.67	3.12	3.62	1.60
PII	625	425	255	135	105	75	65	0.60	3.43	4.18	2.50
PIII	650	460	320	205	140	95	75	0.70	2.78	3.47	2.00

“ LR = Length of tarsomere  $\text{ta}_1$  divided by length of tibia (ti); BV = Combined length of femur (fe), tibia and  $\text{ta}_1$  divided by combined length of tarsomeres  $\text{ta}_2$ - $\text{ta}_5$ ; SV = Ratio of femur plus tibia to tarsomere  $\text{ta}_1$ ; BR = Ratio of longest seta of  $\text{ta}_1$  divided by minimum width of  $\text{ta}_1$ , measured one third from apex.”

Hypopygium (Figs 7-8) as illustrated in dorsal (Fig. 7) and ventral view (Fig. 8, with anal point and tergite IX removed). Tergite IX nearly semi-circular, broad at basal part and gradually narrowed towards base of anal point; anal tergite bands (ATB) dark, V-shaped, widely open basally and converging posteriorly, abruptly terminated well before base of anal point and not reaching crests of anal point; presence of 4 dorsal setae located between ATB and crest as shown in Fig. 7; teeth on median part of lateral margin absent. Anal point (Figs 5, lateral; 7, dorsal) 45  $\mu\text{m}$  long, maximum width 20-23  $\mu\text{m}$  at base, brownish as remaining parts of hypopygium, long drop-like, nearly parallel-sided medially with pointed apex; presence of 9-10 setae including 4-5 located laterally and 5 ventrally; anal crest well developed, lacking dorsal setae.



Figures 1-13. Male adult of *Rheotanytarsus* spp. Hairs on lateral inner margin of eyes: (1) *R. langtoni* sp. n.; (2) *R. procerus*. Last flagellomere of antenna: (3) *R. langtoni* sp. n.; (4) *R. procerus*. Tergite IX and anal point in lateral view: (5) *R. langtoni* sp. n.; (6) *R. procerus*. *R. langtoni* sp. n.: hypopygium in dorsal (7) and ventral view (8, tergite IX and anal point removed); (9) superior volsella; (10) median volsella; (11) differentiated seta of median volsella. *R. procerus*: (12) superior and median volsellae (dorsal); (13) inferior volsella (ventral).

Figures 1-13. Imago mâle de *Rheotanytarsus* spp. Pubescence du bord interne des yeux: (1) *R. langtoni* sp. n.; (2) *R. procerus*. Dernier segment de l'antenne de: (3) *R. langtoni* sp. n.; (4) *R. procerus*. Tergite IX et pointe anale en vue latérale: (5) *R. langtoni* sp. n.; (6) *R. procerus*. *R. langtoni* sp. n.: hypopyge en vue dorsale (7) et ventrale (8, tergite IX et pointe anale enlevés); (9) volselle supérieure; (10) volselle médiane; (11) soie différenciée de la volselle moyenne. *R. procerus*: (12) volselles supérieure et médiane (dorsale); (13) volselle inférieure (ventrale).

Sternapodeme (Fig. 8), lateral horn-like projections markedly present basally; coxapodeme linear, inner part broad and turns over distally to join the upper basal part of sternapodeme, outer smaller branch projecting upwards to join the distal part of coxapodeme; phallapodeme linearly elongated, gradually pointed basally, bifurcate in median part. Superior volsella (Figs 7, 9) about 45 µm long, 25 µm maximum width, nearly sub-triangular, longitudinally extended, wide at base and gradually tapered distally towards apex which has a hook-shaped appearance; setiger area (SA) with 7 setae located laterally (2 close to the inner margin, 5 shorter close to the outer margin; digitus absent. Median volsella (Figs 8, 10), stem 23-25 µm long does not reach beyond tip of superior volsella, uniformly linear, bi-lobed apically and distinctly bent outwards distally; differentiated setae (Figs 10, 11) typically lamelliform, parallel-sided proximally, but curved and setae-like apically. Inferior volsella (Figs 7, dorsal; 8, ventral) about 70-75 µm long, 35 µm maximum width, wider at base, reaching half length of gonostylus, slightly bent inwards distally; setiferous ventral lobe weakly developed and bearing 3 setae located close one to another. Gonocoxite 135 µm long, 55-60 µm maximum width, with 8-9 setae. Gonostylus (Fig. 7) 120 µm long and about 25-30 µm maximum width, moderately swollen medially, tapering in its distal half to a pointed apex; inner margin with 1-2 row of 8-10 fine long setae. HR 1.13.

**Pupal exuviae and larva:** unknown

### ***Rheotanytarsus procerus* Reiss, 1991**

The original description of *R. procerus* (male adult and pupal exuviae) was provided by REISS (1991), to which are supplemented some additional relevant characters. A short redescription of the male pupal exuviae of this species is given here, based on paratype material deposited in Zoologische Staatlung, Munich ZSM.

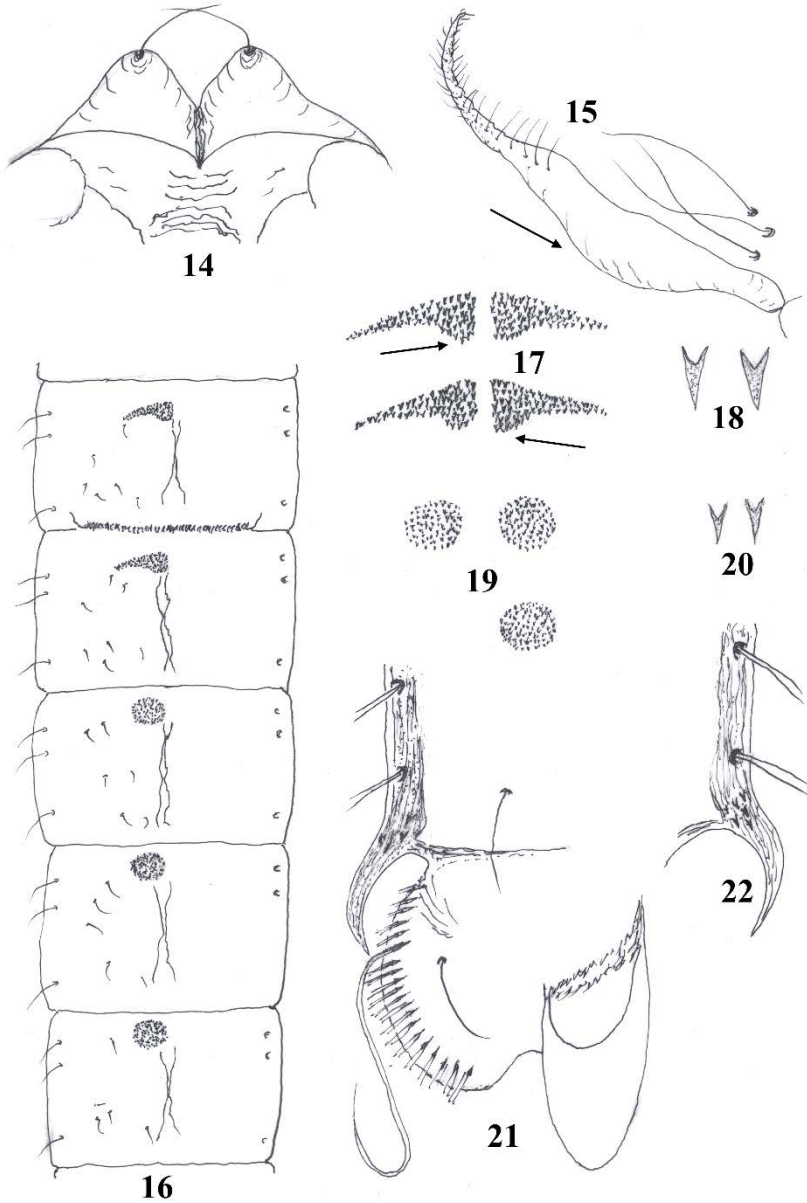
#### **Male pupal exuviae**

(n = 3, collection of ZSM) (Figs 14-22)

Colouration pale to brown in general. Frontal apotome brown and moderately wrinkled. Cephalothorax smooth without granulation; thoracic horn and wing sheath transparent; outer and inner margin of antennal sheath brownish. Abdomen pale to brownish. Anal comb brown to dark brown, anal lobe and genital sac brownish. Total length 1.75-1.80 mm.

Cephalothorax (Figs 14-15). Frontal tubercles (Fig. 14) conical, frontal seta 35-40 µm long, bristle-like; anteprenotals 85 and 45 µm long; dorsocentrals setae-like, length (in µm) of Dc1-Dc4: 10-15, 40, 25, 35. Thoracic horn 375 µm long, strongly swollen in proximal half, uniformly narrowing distally, bearing 9-10 setulae on distal half and numerous shorter setae apically; pre-corneals 160-165, 110-115 and 85 µm long. Abdomen with armament and chaetotaxy on tergites II-VI as in Figs 16-20. Tergites II-VI each with a pair of small spines patches placed anteromedially, spines are smaller on tergites IV-VI (Figs 18, 20); tergite II with 45-50 hooks located in one transverse row. Anteromedian small spine patches of tergites II-III (Figs 16-18) markedly elongated and nearly twice as broad as long, median part distinctly swollen posteriorly (Figs 16-17); tergites IV-VI with circular spine pair patches (Figs 16, 19-20). Shagreen absent on all tergites. Segments II-V with 3 lateral setae; segments VI-VIII each with 4 taeniae. Anal comb on segment VIII (Figs 21-22) about 30 µm long and 8 µm maximum wide at base. Anal segment 160-165 µm long, maximum width 200-210 µm; fringe on anal lobe with 17-20 taeniae, dorsal setae 45-55 µm long. Genital sac 170-175 µm long, overreaching anal lobe by 70-75 µm.





Figures 14-22. Male pupal exuviae of *Rheotanytarsus procerus*. (14) frontal apotome; (15) thoracic horn; (16) abdominal segments II-VI (half left-side, dorsal) with armament and chaetotaxy; details of armament on tergites II-VI: (17-18) tergites II-III; (19-20) tergites IV-VI; (21-22) posterolateral comb of segment VIII and anal lobe, 2 aspects.

Figures 14-22. Exuvie nymphale mâle de *Rheotanytarsus procerus*. (14) pièce frontale; (15) corne thoracique; (16) segments abdominaux II-VI (moitié gauche, dorsale), ornementation et chaetotaxie; détails de l'ornementation sur les tergites II-VI: (17-18) tergites II-III; (19-20) tergites IV-VI; (21-22) peigne postéro-latéral du segment VIII avec lobe anal, 2 aspects.

**Larva**

Unknown

**4. Taxonomic position**

*Rheotanytarsus langtoni* sp. n. keys directly into the *guineensis*-group, which consists of 19 species mainly occurring in Europe and Africa (e.g. *R. abonae* Kyerematen, 2000; *R. dactylophoreus* Moubayed-Breil, Langton & Ashe, 2012; *R. guineensis* Kieffer, 1918; *R. nigricauda* Fittkau, 1960; *R. procerus* Reiss, 1991; *R. reissi* Lehmann, 1970; *R. rhenanus* Klink, 1983; *R. ringei* Lehmann, 1970; *R. rioensis* Langton & Armitage, 1995). Despite the resemblance between *R. langtoni* sp. n. and *R. procerus*, mainly based on some similar characters found in the male adult, the new species can be easily distinguished in having: hairs on inner margin of eyes located proximally (Fig. 1), instead of medially in *R. procerus* (Fig. 2); anal point in lateral view with pointed apex and lacking dorsal setae on the crest area (Fig. 5), differently figured in *R. procerus* (Fig. 6); inner margin of superior volsella distinctly sinuous and swollen basally (Figs 7, 9), linear and gradually tapering apically in *R. procerus* (Fig. 12; LEHMANN 1970, Figs 4, 4b); setiferous ventral lobe of inferior volsella with 3 grouped setae (Fig. 8), one of the setae widely separated from the other two in *R. procerus* (Fig. 13).

Keys to male imagines and pupal exuviae of known *Rheotanytarsus* species from the Afrotropical and West Palaearctic Regions have been previously published (LEHMANN 1970, KYEREMATEN & SÆTHER 2000, MOUBAYED-BREIL et al. 2012). Consequently, *R. langtoni* sp. n. can be easily separated from other known related species based on the combination of some differentiating morphological features found in the male adult, which are summarized in the following key.

**Key to separate *R. langtoni* sp. n. from related species known from the Moroccan Rif:**

1. Median volsella extremely long, with stem overreaching tip of median volsella; lamellae reaching distal part of gonostylus ..... *R. distinctissimus* (Brundin, 1947)
  - Median volsella much shorter, with stem not overreaching tip of median volsella; lamellae not reaching distal part of gonostylus ..... **2**
2. Median volsella with more or less flattened plate distally, stem usually S-shaped, rarely straight ..... several species (including: *R. curtistylus* Goetghebuer, 1921; *R. langtoni* sp. n.; *R. muscicola* Thienemann, 1929; *R. pentapoda* Kieffer, 1909; *R. photophilus* Goetghebuer, 1921; *R. procerus* Reiss, 1991; *R. reissi* Lehmann, 1970; *R. rhenanus* Klink, 1983; *R. ringei* Lehmann, 1970; *R. rioensis* Langton & Armitage, 1995)
  - Median volsella with setiform or spatulate lamellae, stem not S-shaped either straight or slightly curved (Figs 8, 10, 12) ..... **3**
3. Median volsella exclusively composed of spatulate lamellae distally (LEHMANN 1970, Figs 15-16); digitus vestigial ..... *R. nigricauda* Fittkau, 1960
  - Median volsella bearing setiform setae, or lamelliform lamellae distally (Figs 8, 10, 12); digitus absent ..... **4**



- 4. Median volsella bearing only setiform setae, lamelliform lamella absent (Fig. 12; REISS 1991, Fig. 4c); inner margin of superior volsella not swollen basally (Fig. 12; REISS 1991, Figs 4, 4b); setiferous ventral lobe with 3 separate setae (Fig. 13).....*R. procerus* Reiss, 1991
- Median volsella with both setiform setae and lamelliform lamellae (Figs 8, 10); inner margin of superior volsella markedly swollen basally (Figs 7, 9); setiferous ventral lobe with 3 grouped setae (Fig. 8) ..... *R. langtoni* sp. n.

### 5. Ecology and geographical distribution

*R. langtoni* sp. n. is a rheophilic species associated with karstic helocrenes and stenothermic streams where bryocolous and hygropetric habitats consist of shaded pristine rheocrenes, waterfalls and rhithral on stony to gravely and sandy substrata. It belongs to the crenobiontic and crenophilous community of species as documented by LINDEGAARD (1995). Such lotic habitats, which are endangered by ecotourism and both natural and accidental flooding, deserve much greater consideration, protection and preservation.

The new species is only known from the upper basin of Farda Wadi (Rif, north western Morocco, alt. 500-600 m, photo 1) which is considered to be a local cold important enclave in the preservation of biological indicators species. The loss of such species would be indicative of global warming and climate change in this biogeographical region. Geographical distribution of *R. langtoni* sp. n. and other related species throughout the Moroccan Rif is illustrated (Fig. 23).

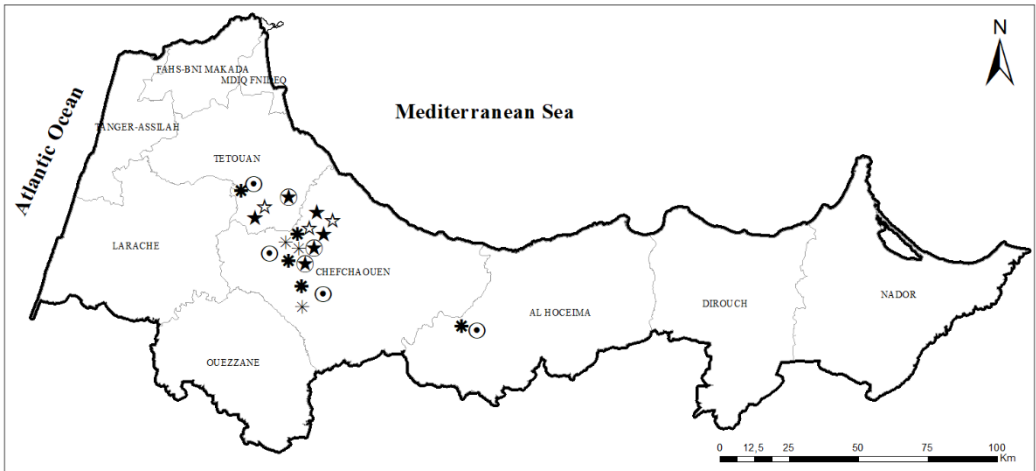


Figure 23. Geographical distribution of the six known *Rheotanytarsus* species (*guineensis*-group) from the Moroccan Rif: *R. nigricauda* ★, *R. procerus* ●, *R. reissi* \*, *R. rhenanus* ★, *R. ringei* ☆, *R. rionensis* \*.

Figure 23. Distribution géographique des six espèces du genre *Rheotanytarsus* (groupe *guineensis*) connues du Rif marocain: *R. nigricauda* ★, *R. procerus* ●, *R. reissi* \*, *R. rhenanus* ★, *R. ringei* ☆, *R. rionensis* \*.

The chironomid communities occurring in rivers and streams delimited by the Mediterranean coastal ecosystem of Morocco are still little known and need more investigation. During the last three decades, both lotic and lentic habitats are becoming degraded and seriously threatened by

the impact of various human activities and perturbation factors (ecotourism, construction work, camping, modifications of habitats, release of toxic chemical pollutants, eutrophication, natural and accidental flooding). In addition, these habitats consist of endangered hotspots of diversity similar to what is found in many coastal ecosystems around the world (MOUBAYED-BREIL 2008, MOUBAYED-BREIL et al. 2013, MOUBAYED-BREIL & ASHE 2012, 2016). Their biogeographic significance is still underestimated and deserves therefore greater consideration, protection and preservation in the years to come.

Associated species encountered in the same locality as *R. langtoni* sp. n. (KETTANI & MOUBAYED-BREIL 2018) include: *Boreoheptagyia legeri* (Goetghebuer, 1933); *Diamesa hamaticornis* Kieffer, 1924; *D. insignipes* Kieffer, 1908; *D. latitarsis* (Goetghebuer, 1921); *Potthastia gaedii* (Meigen, 1838); *Bryophaenocladus aestivus* (Brundin, 1947); *B. nidorum* (Edwards, 1929); *B. subvernalis* (Edwards, 1929); *Chaetocladus acuticornis* Kieffer, 1914; *C. dentiforceps* (Edwards, 1929); *C. melaleucus* (Meigen, 1818); *C. piger* (Goetghebuer, 1913); *Corynoneura cariana* Edwards, 1924; *C. celtica* Edwards, 1924; *C. lobata* Edwards, 1924; *Eukiefferiella minor* (Edwards, 1929); *E. tirolensis* Goetghebuer, 1938; *Heleniella ornaticollis* (Edwards, 1929); *H. serratosioi* Ringe, 1976; *Krenosmittia camptophleps* (Edwards, 1929); *Metriocnemus albolineatus* Meigen, 1918; *M. eurynotus* (Holmgren, 1883); *Orthocladus frigidus* (Zetterstedt, 1838); *Parametriocnemus stylatus* (Spärck, 1923); *P. valescurensis* Moubayed & Langton, 1999; *Pseudorthocladus curtistylus* (Goetghebuer, 1921); *Rheocricotopus effusus* (Walker, 1856); *Thienemannia gracilis* Kieffer, 1909; *Micropsectra junci* (Meigen, 1818); *M. notescens* (Walker, 1856); *Rheotanytarsus curtistylus* (Goetghebuer, 1921) and *Stempellina bausei* (Kieffer, 1911).

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