

Orthotylus (Pachylops) neoriegeri sp. n., a new plant bug from Morocco (Heteroptera, Miridae, Orthotylinae)*

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Abstract

Orthotylus (Pachylops) neoriegeri sp. n. is described from Morocco (South Anti-Atlas). Colour dorsal habitus and illustrations of male and female genitalia are provided. The specimens were collected by beating *Cytisus balansae* (Fabaceae). Based on the pilosity, the male genitalia and the host-plant association, the new species is placed in the subgenus *Pachylops* FIEBER, 1858. It differs from the other species mainly by the brown coloration and the phallic sclerotized appendages of the male. Host-plant association within the subgenus *Pachylops* is briefly discussed.

Kurzfassung

***Orthotylus (Pachylops) neoriegeri* sp. n., eine neue Miride aus Marokko (Heteroptera, Miridae, Orthotylinae)**

Orthotylus (Pachylops) neoriegeri sp. n. aus Marokko wird beschrieben. Dargestellt werden der farbige dorsale Habitus und der Bau der männlichen und weiblichen Genitalien. Die Tiere wurden durch Abklopfen von *Cytisus balansae* (Fabaceae) erbeutet. Aufgrund der Behaarung, der männlichen Genitalien und der Wirtspflanzenbindung wird die neue Art in die Untergattung *Pachylops* FIEBER, 1858, gestellt. Sie unterscheidet sich von anderen Arten vor allem durch die braune Färbung und die sklerotisierten Anhänge des Phallus. Die Wirtspflanzenbindung innerhalb der Untergattung *Pachylops* wird kurz diskutiert.

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Introduction

The plant bug genus *Orthotylus* FIEBER, 1858, includes more than 400 species and has a worldwide distribution (see SCHUH 1995 and the online version of the world mirid catalog: <http://research.amnh.org/pbi/catalog/>). According to

KERZHNER & JOSIFOV (1999) and AUKEMA et al. (2013), 146 species and subspecies are recognized within the Palaearctic region and these are grouped in ten subgenera (*Orthotylus* FIEBER, 1858, *Pachylops* FIEBER, 1858, *Litocoris* FIEBER, 1860, *Melanotrichus* REUTER, 1875; *Labopidea* UHLER, 1877, *Pinocapsus* SOUTHWOOD, 1953, *Parapachylops* EHANNO & MATOCQ, 1990, *Pseudorthotylus* POPPIUS, 1914, *Kiiorthotylus* YASUNAGA, 1993, *Yamatorthotylus* YASUNAGA, 1999). A key for the seven subgenera which occur in the Western Palaearctic was provided by EHANNO & MATOCQ (1990).

In this paper we describe a new species of *Orthotylus* from Morocco belonging to the subgenus *Pachylops*. The intricate nomenclatural problems posed by this taxon and its type species have been clarified by CARAPEZZA (1997), CARAPEZZA & KERZHNER (1998), ICZN 2000. As a consequence, the subgenus *Neopachylops* WAGNER, 1956, was synonymized with *Pachylops* and thus the subgenus now comprises 18 species and subspecies – many of them having been previously placed in the subgenus *Neopachylops* (KERZHNER & JOSIFOV 1999). These species include two recently described species, *O. (Pachylops) jordii* PAGO-LA-CARTE & ZBALEGUI, 2006, from Spain, and *O. (Pachylops) smaragdinus* LIU, 2009, from China (AUKEMA et al. 2013). Within the subgenus *Pachylops*, three species and one subspecies are currently known from Morocco: *virescens* (DOUGLAS & SCOTT, 1865), *membraneus* LINDBERG, 1940, *adenocarpus maroccanus*, WAGNER, 1958, and *maurus* (WAGNER, 1969) (KERZHNER & JOSIFOV 1999).

Orthotylus (Pachylops) neoriegeri sp. n.

Holotype: ♂, Morocco, Tizin-n-Test, Route 203, Borne 129 [N 30° 52' 874, W 8° 20' 901], Altitude leg 2098 m, 10.05.2009, A. MATOCQ & PH. MAGNIEN leg. (Museum national d'Histoire naturelle, Paris).

Paratypes: 1 ♂, 1 ♀, same data as holotype (Museum national d'Histoire naturelle); 7 ♂♂, 14 ♀♀, same data as holotype (coll. MATOCQ, Paris); 6 ♂♂,

* Dr. CHRISTIAN RIEGER, honouring his 70th birthday.



Figure 1. Color dorsal habitus of male *O. (Pachylops) neoriegeri* sp. n.



Figure 2. Colour dorsal habitus of female *O. (Pachylops) neoriegeri* sp. n.

6 ♀♀, same data as holotype (coll. MAGNIEN, Paris); 1 ♂, 1 ♀, same data as holotype (coll. RIEGER, Nürtingen); 1 ♂, 1 ♀, same data as holotype (col. STREITO, Montpellier).

Description (male)

Body slightly elongate (fig. 1). Total length 5.2 mm. Head, antenna, pronotum, scutellum, and ventral side black; eyes reddish brown; hemelytra yellowish brown, slightly translucent, membrane and veins infusate; legs orange yellow except base of tibiae slightly darkened, tibial spines brown and tarsi darkened. Surface entirely shiny. Vestiture: dorsum bearing two types of pubescence, numerous recumbent pale scale-like setae (easily rubbed off) mixed with sparse, dark and suberect setae; venter with long and pale

setae. Head: vertex slightly carinate, synthipsis twice the width of eye; antennal segments (in mm): I (0.30), II (1.05), III (0.7), IV (0.4); rostrum reaching the intermediate coxae.

Genitalia: Parameres spoon-shaped; left paramere (fig. 3); right paramere (fig. 4) strongly serrated; phallus with two unbranched sclerotized appendages (fig. 5): – a stout and long process, apically strongly denticulate, its apex hook-like, its basal third bearing a short finger-like spicule; – a thin and shorter process, curved at right angle and smooth.

Description (female)

Body ovate (fig. 2). Total length 4.2 mm. Similar to male in coloration, vestiture and structure, except: synthipsis three times the width

of eye; antennal segments (in mm): I (0.30), II (1.05), III (0.6), IV (0.5).

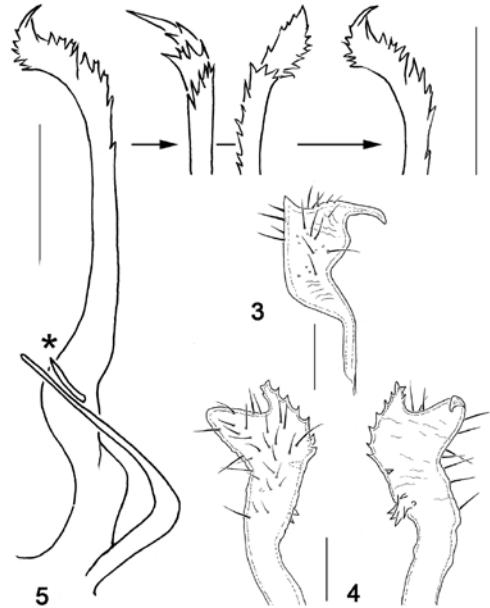
Genitalia: Subgenital plate triangular, longer than wide. Bursa copulatrix (fig. 6) as wide as long. Sclerotized ring very thin, elongate, weakly sclerotized with fine intermittent serrations, posterior part almost indistinct. Paired oviducts widely separated. Vermiform gland opening anterior to oviducts, between a pair of membranous dorsal pouches. Seminal sac of moderate size. Posterior wall: dorsal lobes of interramal sclerites (fig. 8) prominent with a blunt curved projection; apex of the projection strongly denticulate, other parts of the lobe only with sparse microspiculi. Basis of gonapophyses VIII and vulva (fig. 7) with various cuticular protuberances, unpigmented, convoluted and intertwined.

Distribution: So far only known from Morocco (South Anti-Atlas).

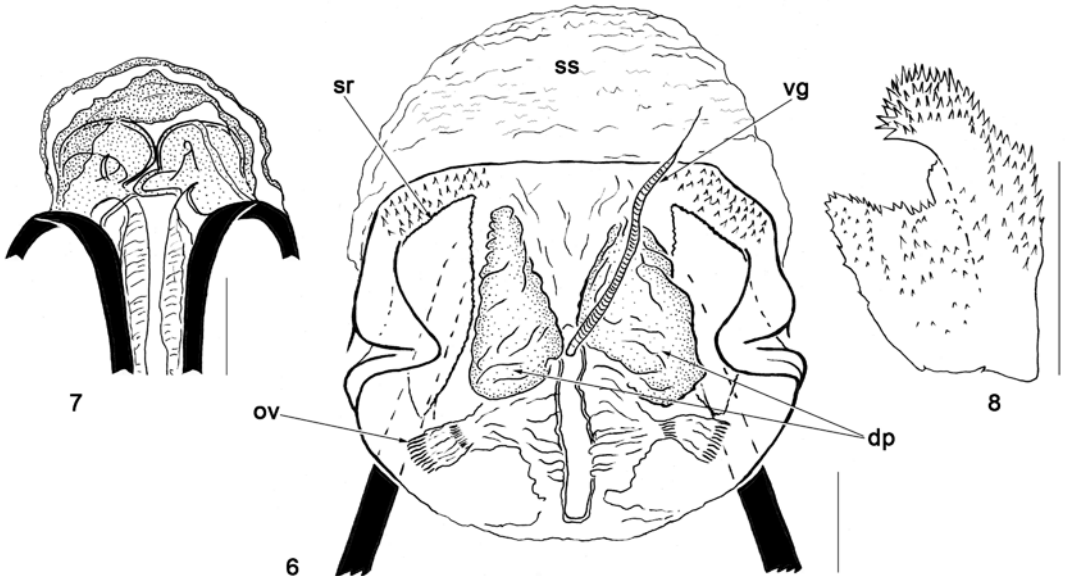
Habitat: The specimens were collected by beating *Cytisus balansae* (Fabaceae).

Etymology

Dedicated with pleasure to our colleague CHRISTIAN RIEGER, on the occasion of his 70th birthday, for his great contribution to the Palaearctic Catalogue of Heteroptera. The greek prefix "neo"



Figures 3-5. Male genitalia of *O. (Pachylops) neoriegeri* sp. n. – (3) Left paramere. – (4) Right paramere, dorsal and ventral view. – (5) Phallic sclerotized appendages; arrows indicate different views of the serrated apical part of the larger appendage; asterisk indicates the location of the finger-like spicule. Scale bars: 2 mm.



Figures 6-8. Female genitalia of *O. (Pachylops) neoriegeri* sp. n. – (6) Bursa copulatrix, dorsal view. (7) Basis of the gonapophyse VIII and vulva. (8) Dorsal lobe of interramal sclerite. – Abbreviations: dp: dorsal pouches; ov: oviduct; sr: sclerotized ring; ss: seminal sac; vg: vermiform gland. Scale bars: 2 mm.

(meaning “new”) is added to avoid confusion with *Orthotylus (Melanotrichus) riegeri* HECKMANN, 2000, now transferred to the genus *Blepharidopterus* KOLENATI, 1845 (HECKMANN 2001).

Discussion

O. (Pachylops) neoriegeri sp. n. can be separated at first sight from most other Euro-Mediterranean *Orthotylus* species by its brown coloration. Palearctic *Orthotylus* species are normally predominantly green bugs (usually turning yellowish as dry specimens). Some exceptions exist, such as *O. (Melanotrichus) rubidus* (PUTON, 1877) a reddish green to red species, *O. (Melanotrichus) nocturnus* LINNAUORI, 2004, dark brown, *O. (Pinocapsus) fuscescens* (KIRSCHBAUM, 1856) olive brown, *O. (s. str.) obscurus* REUTER, 1875, brown to black and *O. (s. str.) psalloides* WAGNER, 1959, a very dark species that also occurs in Morocco. However, the species so far included in the subgenus *Pachylops* are all green.

We are placing *O. (P.) neoriegeri* sp. n. in the subgenus *Pachylops* because of its vestiture, the male genital structures and the host plant association.

Vestiture: According to WAGNER (1974) and EHANNO & MATOCQ (1990), two types of setae – scale-like recumbent pale setae and suberect dark setae – like those of *O. (P.) neoriegeri* sp. n., distinguish the representatives of the subgenus *Neopachylops*, now a junior synonyme of *Pachylops* as mentioned in the introduction (CARAPEZZA 1997; CARAPEZZA & KERZHNER 1998; ICZN 2000).

Genitalia: Within the Orthotylinae, male genital structures, i.e. the parameres and the phallic sclerotized appendages, are very complex, making them difficult to illustrate and to compare. This is particularly the case for the genus *Orthotylus*. EHANNO & MATOCQ (1990) indicated the presence of complicated parameres and of branched sclerotized appendages of the phallus, serrated or not. In fact, in the subgenus *Pachylops*, it seems that the two sclerotized phallic appendages are simple, usually unbranched and relatively poorly serrated as in *O. (Pachylops) concolor* (KIRSCHBAUM, 1856) (SOUTHWOOD 1953), *O. (P.) virescens* (WAGNER, 1974) (CARAPEZZA, 1977), *O. (P.) jordii* (PAGOLA-CARTE & ZABALEGUI, 2006) and for the other species as far as it is possible to distinguish details in the illustrations given by WAGNER (1974). In other subgenera, the sclerotized phallic appendages are more branched

and serrated (see for instance SOUTHWOOD, 1953, CARAPEZZA 1997, WYNIKER & BURCKHARDT, 2003), except in the subgenus *Melanotrichus* in which they can be simple and smooth (WAGNER, 1974, CARAPEZZA, 1997, WYNIKER & BURCKHARDT, 2003; LINNAUORI, 2004).

In the female, the dorsal lobes of the interramal sclerites, often illustrated in various *Orthotylus* species (SOUTHWOOD, 1953, SOUTHWOOD & LESTON, 1959, WAGNER, 1974, EHANNO & MATOCQ, 1990, YASUNAGA, 1999, PAGOLA-CARTE & ZABALEGUI, 2006, PAGOLA-CARTE & RIBES, 2007, PAGOLA-CARTE & RIBES, 2008), do not seem able to supply reliable characters for the time being; they appear rather variable and not very characteristic at specific or subgeneric level. Within the subgenus *Pachylops*, the dorsal wall of the bursa copulatrix of *neoriegeri* sp. n. can only be compared with that of the two *Pachylops* species *O. (P.) empetri* and *O. (P.) concolor* illustrated by PAGOLA-CARTE & RIBES (2008). Contrary to all expectations, this comparison does not show interesting differences or similarities. On the other hand, the detailed illustrations of the bursa copulatrix given by PAGOLA-CARTE & RIBES (2007) for four species of *Orthotylus* s. str. show clearly that the conformation of the dorsal wall of the bursa can offer distinctive features, i.e. definite specific characters possibly also useful at the subgeneric level.

Host plant association: *Orthotylus* spp. live on plants belonging to various plant families (SCHUH, 1995) and several representatives of the genus are also known as predators of aphids and psyllids (WHEELER 2001). *O. (P.) neoriegeri* sp. n. was collected on *Cytisus balansae*. Within the subgenus *Pachylops*, the species are predominantly associated with a few closely related genera in the Fabaceae: *Cytisus* [also cited as *Sarothamnus*], *Genista*, *Adenocarpus*, *Calicotome*, *Retama*, *Spartium* (GÖLLNER-SCHIEDING 1968, 1970, 1972, WAGNER 1974, CARAPEZZA 1997, PAGOLA CARTE & ZABALEGUI 2006, PAGOLA CARTE & RIBES 2008). Only two species are known to live on plants of other groups: *O. (P.) thymelaeae* Wagner, 1965, and *O. (P.) empetri* Wagner, 1977, are associated with Thymelaeaceae (see PAGOLA CARTE & RIBES 2008 for details). To our knowledge, no species in the other subgenera of *Orthotylus* live on *Genista*, *Cytisus* or related Fabaceae. In both “host list indexes” included in the mirid Catalogue, SCHUH (1995) erroneously suggested that two species – *O. (s. str.) prasinus* (FALLÉN, 1826) and *O. (s. str.) viridinervis* (KIRSCHBAUM, 1856) – are found on

"*Sarothamnus scoparius*". However, for both these species the authors cited in the catalogue, as well as others, actually indicate other host plants such as *Salix*, *Populus* (Salicaceae), *Ulmus* (Ulmaceae), *Tilia* (Tiliaceae), *Daphne* (Thymelaeaceae), *Sorbus* (Rosaceae), *Fagus* (Fagaceae) etc. (SOUTHWOOD & LESTON 1959, GÖLLNER-SCHIEDING 1970, 1972, 1974, PUTSHKOV 1971, WAGNER 1974, HENRY & WHEELER 1979, KELTON 1982, TAMANINI 1982, EHANNO 1987), and no Fabaceae.

A single possible exception is the case of the dark brown coloured *O.* (s. str.) *psaloides*. This species, so far only known from Morocco by the male holotype, has been collected in large numbers on *Genista* sp., again in Morocco (MATOCCQ, unpublished obs.). The male, once dissected, had parameres similar to those of *O.* (*P.*) *neoriegeri* sp. n., but quite different phallic appendages, showing that it is a distinct species. Taking into account the importance, in the mirid family, of the frequent close association between a group of related species with a plant or a group of related plants, this case is fairly interesting and could indicate, once more, the necessity of redefining *Pachylops* and the other subgenera on the basis of additional characters. *Orthotylus* is considered as a heterogeneous genus in need of a comprehensive review (SCHUH 1995, KERZHNER & SCHUH 1995, KERZHNER & JOSIFOV 1999, YASUNAGA 1999).

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