

Additional data towards the knowledge of european *Podismini* Jacobson, 1905 (Orthoptera, Acrididae, Melanoplinae)

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ABSTRACT

This paper describes *Peripodisma llofizii* n. sp., discovered during the summer of 2014 on Mount Llofiz around 1700 m above sea level, located in the North of Erind village in the district of Gjirokastra, in Albania. Very similar to *P. tymphii* Willemse, 1972, and known in the region of Epirus in Greece, up to and slightly beyond the border in Albania, it nevertheless differs from the latter by obvious morphological characters such as the colour of its hind tibia, the shape of the genital plate of the female, the supra-anal plate, the furculae and several parts of the male phallic complex.

RÉSUMÉ

Données nouvelles relatives à la connaissance des Podismini Jacobson, 1905 européens (Orthoptera, Acrididae, Melanoplinae).

Cet article décrit *Peripodisma llofizii* n. sp., découvert durant l'été 2014 sur la montagne de Llofiz autour de 1700 m d'altitude, au nord d'Erind dans le district de Gjirokastra, en Albanie. Très proche de *P. tymphii* Willemse, 1972, connu de la région de l'Épire en Grèce avec un léger débordement sur l'Albanie, il s'en différencie néanmoins par des caractères morphologiques évidents tels que la couleur des tibias postérieurs, la forme de la plaque sous-génitale chez la femelle, de la plaque supra-anale, des furculae et de plusieurs éléments du complexe phallique chez le mâle.

KEY WORDS

Description,
morphology,
ecology,
Pindos massif,
Albania,
new species.

MOTS CLÉS

Description,
morphologie,
écologie,
massif du Pinde,
Albanie,
espèce nouvelle.

INTRODUCTION

The Pindos massif in Greece contains a great richness of endemic Orthoptera particularly in the Podismini Jacobson, 1905 tribe as evidenced by the group *Oropodisma karavica-tymphrestosi-willemsei* related to these mountains (Willemse 1984). This is also the case of genus *Peripodisma* Willemse, 1972, known by a single species *Peripodisma tymphii* Willemse, 1972, endemic to the mountains of Pindos. Originally described from Mt Timfi, Epirus (Willemse 1972), this taxon has been later reported from Mt Tomaros (Willemse 1984) and more recently from Mt Soulion and Mt Khionistra, all being in the same region (Willemse 2008). In 2014, we found it around 1800 m a.s.l., between Mt Nemerska (Nemërçkë) and Mt Silvit, West of Konitsa (Greece), occurring widely on both sides of the border between Albania and Greece (Fig. 1).

In Greece, over most of its distribution range, it is currently reported that the distribution and abundance of *Peripodisma tymphii* has significantly decreased, linked to sheep overgrazing, made worse by the recent introduction of cattle in these mountainous areas. On the global red list of threatened species, *P. tymphii* is now classified by the IUCN as Endangered (EN), according to criteria B1ab(v)+2ab(v), based on the size of the area of occupancy, and extent of occurrence, the few locations and the continuing decline in the number of mature individuals (<http://www.iucnredlist.org/>).

In the present paper, we describe *Peripodisma llofizii* n. sp. from Mount Llofiz, District of Gjirokastra, Albania. The discovery of this species in the North-West of the Pindos massif provides interesting information on the biogeography of the genus.

MATERIALS AND METHODS

REPOSITORIES

The material is deposited in the Orthoptera collection of the Muséum national d'Histoire naturelle, Paris, and in the collection of Michèle Lemonnier-Darcemont (Callian, Var, France). The types deposited in the MNHN are recorded in the specimen database of the MNHN, where they can be found, together with all available geographical information at <http://science.mnhn.fr/institution/mnhn/collection/eo/search>

CLASSIFICATION

The taxonomic nomenclature used follows the Orthoptera Species File (OSF) (Eades *et al.* 2014).

MORPHOLOGY AND MEASUREMENTS

Measurements and drawings were made using a binocular microscope fitted with micrometre. Male genitalia are named after Harz (1975).

ABBREVIATIONS

Coll. ML-D collection of Michèle Lemonnier-Darcemont (Callian, Var, France).

MNHN Muséum national d'Histoire naturelle, Paris

Male genitalia (cf figures)

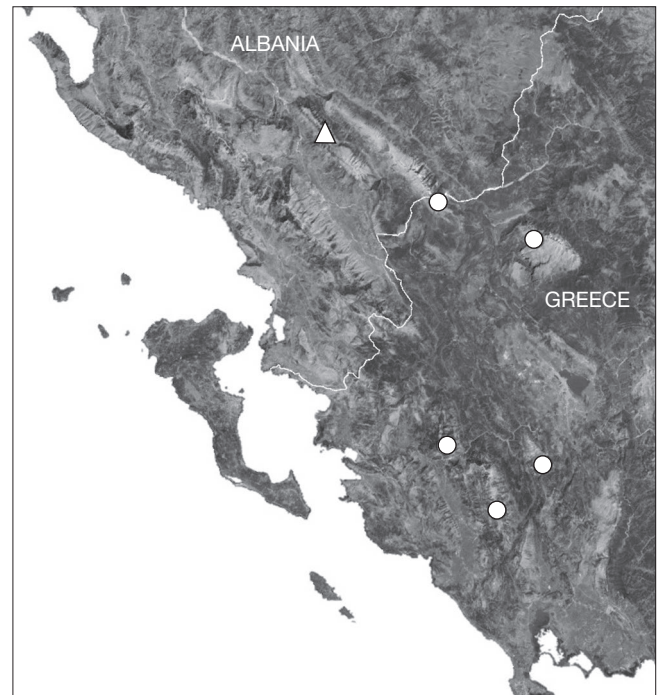


FIG. 1. — Map of known localities of *Peripodisma* Willemse, 1972: ○, *P. tymphii* Willemse, 1972; ▲, *P. llofizii* n. sp.

SYSTEMATICS

Family ACRIDIDAE
Subfamily MELANOPLINAE Scudder, 1897
Tribe PODISMI Jacobson, 1905

Genus *Peripodisma* Willemse, 1972

TYPE SPECIES. — *Peripodisma tymphii* Willemse, 1972: 81-85.

TYPE LOCALITY. — Mt Tymphi (Greece).

NEW LOCALITY. — Around 1800 m above sea level, Mt Tumba between Mt Nemerska (Nemërçkë) and Mt Silvit, in West of Konitsa (Greece), occurring widely on both sides of the border between Albania to Greece.

STUDIED MATERIAL. — 5 ♂, 6 ♀, Mt Tumba, 9 August 2014, *legit* Michèle Lemonnier-Darcemont; 4 ♂, 5 ♀ (coll. ML-D) and 1 ♂, 1 ♀ (MNHN).

Peripodisma llofizii n. sp.

TYPE MATERIAL. — **Holotype**: Albania, Mt Llofiz, North of Erind, district of Gjirokastra, 1725 m, 40°12'56.7"N, 20°09'52.9"E, 1 ♂, 25.VII.2014, *legit* Michèle Lemonnier-Darcemont (MNHN-EO-CAELIF2302).

Paratypes: 6 ♂, 7 ♀, 1 ♀ labelled allotype, same data as for holotype, MNHN-EO-CAELIF2303; 6 ♂, 6 ♀, same data as for holotype, coll. M. L.-D.

ETYMOLOGY. — Species named after the mountain where it was found.



FIG. 2. — Ventral view of the abdomen of female: **A**, *Peripodisma llofizii* n. sp.; **B**, *Peripodisma tymphii* Willemse, 1972.



FIG. 3. — Abdominal apex of male: **A**, *Peripodisma llofizii* n. sp.; **B**, *Peripodisma tymphii* Willemse, 1972.

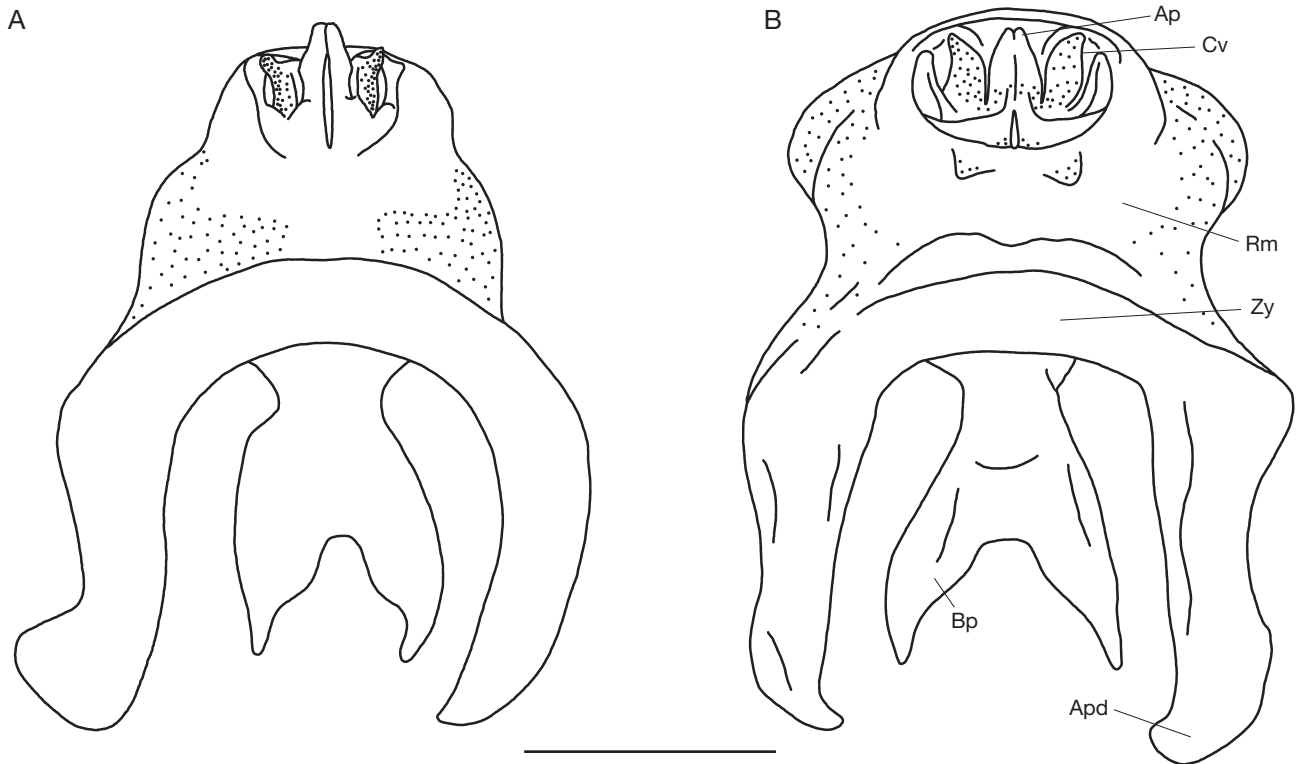


FIG. 4. — Phallus complex of male in dorsal view: **A**, *Peripodisma llofizii* n. sp.; **B**, *Peripodisma tymphii* Willemsse, 1972. Abbreviations: **Ap**, apical valves of penis; **Cv**, cingular valves; **Rm**, rami; **Zy**, zygoma; **Bp**, basal valves of penis; **Apd**, apodeme of cingulum. Scale bar: 1 mm.

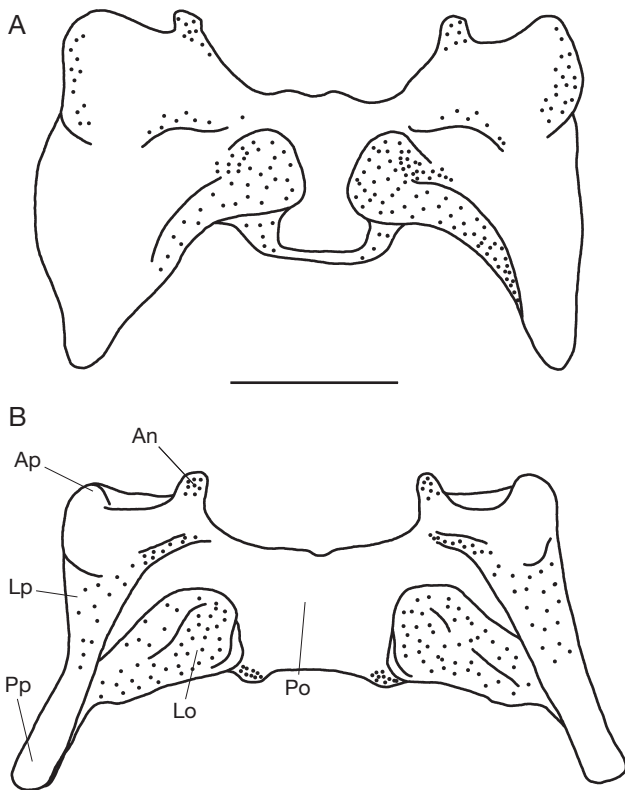


FIG. 5. — Epiphallus of male in dorsal view: **A**, *Peripodisma llofizii* n. sp.; **B**, *Peripodisma tymphii* Willemsse, 1972. Abbreviations: **Ap**, anterior projection; **Lp**, lateral pons; **Pp**, posterior projection; **Lo**, lophus; **Po**, pons; **An**, ancora. Scale bar: 1 mm.

DIAGNOSIS. — The habitus and external measurements of *Peripodisma llofizii* n. sp. are very close to that of *P. tymphii*. Both species differ in the following characters (Figs 2;5): for both sexes: lateral and medial parts of the posterior tibia off-white (bluish in *P. tymphii*). For the female: sub genital plate as wide as long (slightly longer than wide in *P. tymphii*). For the male: furculae long and thin reaching over half of the length of the epiproct (furculae triangular and short, and reaching at most a fourth of epiproct length in *P. tymphii*); epiproct longer than wide, with a longitudinal median ridge, and after the middle, on each side, with a small bump; sub-apical tubercles elongated and very close to each other (apex acute in *P. tymphii*, epiproct as long as wide, depressed medially and laterally in basal half, with obtuse preapical tubercles significantly distant from each other, lateral margins widely rounded towards the subacute apex). Rami of cingulum only slightly continuously expanded; apex of phallus significantly extending beyond the open space of the W-shaped border of the cingular valves (in *P. tymphii*, rami of cingulum much wider, tip of penis valves extending into, but not beyond the open spaces of the ω-shaped border of the cingular valves). The epiphalli of the two species are well-differentiated including conical posterior projections (tubular in *P. tymphii*), shorter pons and lophi closer each other.

DESCRIPTION

Male holotype (Figs 6; 7)

Specimen in good condition. Medium-sized and rather stocky, sub-cylindrical (body: 21.7; pronotum: 5.5; hind femur 11.9). Integument shiny. Sparse hairs on the whole body and legs. Antennae reaching the pronotal hind margin. Eyes light brown with a few dark spots. Head beige with grey-green. Wide post ocular space. Fastigium verticis wide with a small depression. Pronotum rather smooth, wide, with a straight



Fig. 6. — *Peripodisma llofizii* n. sp. ♂. Holotype, side view. Body length: 21.7 mm.

posterior margin. Prozone, mainly brown with yellow on the sides, longer than metazone. Metazone brown with light brown dots. Sulci well marked and highlighted in black. Median keel marked by an inconspicuous furrow. Lower part of paranota yellowish. Upper part underlined throughout by a broad black fascia extending from behind the eyes up to the apex of the pronotum.

Off-white eardrum wide open in a third circle. Mesonotum, metanotum, pleura and first abdominal segment, mainly dark brown to black, with two blurred spots on each side and some yellowish marks on pleura. Mesasternum and metasternum beige. Abdomen with yellow tergites partly covered near the middle with a diffuse grey green. On each side of the midline, black fascia increasingly wide from T3 to T5, then with constant width until T7. Sternites uniformly yellowish. Posterior margins of the sub-genital plate, of the paraprocts and of the last tergite, black. Furculae black, thin and slender, reaching half the length of the epiproct. Epiproct brown, more or less dark, a little bit longer than wide, acute at the apex. A weak yellowish median ridge, larger at the base, crosses it longitudinally. Lateral margins black with on each side, just after the middle, a little bump in the same color. Subapical tubercles elongated, very close each other. Cerci dark brown, pointed, laterally compressed, conical from the side. Median projections of both dorsal valves close together, shape similar to the letter « W », with the two middle downstrokes together and spatulate at the tip. Tip of the apical penis valves beyond the ventral valves.

Phallus complex of ♂: The dorsal view of epiphallus with vertical ancorae forming a greater notch with anterior projections. Pons short, lophi club-shaped, close each other. Posterior projections wide, taper at the apex. Lateral pons slightly convex. Rami of cingulum wider at the base. Apex of phallus significantly extending beyond the open space of the “W” shaped end of the ventral valves (Fig. 8).

Fore and median legs beige, weakly pinkish. Hind femurs with two blackish fasciae on the dorsal and inner side, the rest of inner area yellow. Knees black in large part. Hind tibia totally yellowish, tips of the spines black. Tarsi yellowish with brown spots especially towards the apex. Arolia big and lanceolate, at least as long as the claws, the latter being black at the tip.

Female allotype (Figs 9; 10)

Specimen in good condition. Sub-cylindrical and quite stocky as the male but larger and with a more cryptic coloring (body: 25; pronotum: 5.5; hind femur: 11.5). Integument shiny. Sparse hairs on the whole body and legs. Antennae not reaching the pronotal hind margin. Eyes brown mottled yellowish. Head grey-green coloured with light brown, with a wide post ocular space. Fastigium verticis wide with a weaker depression compared to the male. Pronotum rather smooth and brown, prozone longer than the metazone, posterior margin straight. Sulci and median keel weakly printed. Upper part of paranota crossed with a broad black fascia from prozone to behind the eye.

Mesonotum uniformly brown, metanotum brown with the posterior margin highlighted of black, pleura beige and grey more or less stained with black shadings. Quarter-circle shaped eardrums light brown to light grey. Tergites slightly greenish brown with some black marks on the sides. Mesasternum and metasternum light brown, slightly pinkish. Sternites light brown to greenish.

Ventral valves of ovipositor with a low post-basal prominence, upper margin of dorsal valves winding. Apex acute. Sub-genital plate at least as wide as long, posterior margin triangular and winding.

Fore and median legs beige, weakly pinkish and greenish. Hind femur colour similar to the male. Knees black in upper part and beige pinkish in the lower part. Tibia yellowish,



FIG. 7. — *Peripodisma illofizii* n. sp. ♂. Holotype, top view. Body length: 21,7 mm.



FIG. 9. — *Peripodisma illofizii* n. sp. ♀. Paratype, top view. Body length: 25 mm.

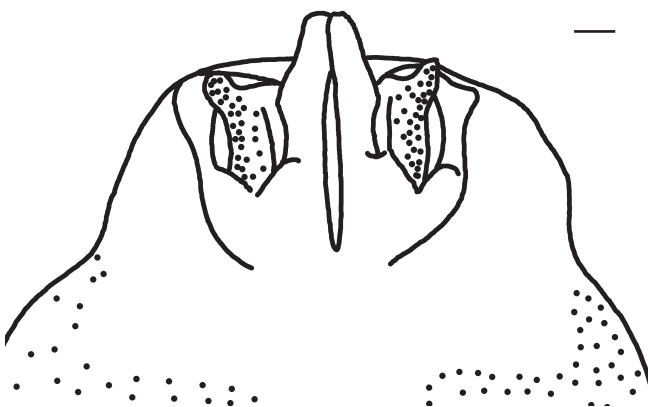


FIG. 8. — Tip of phallus complex of *Peripodisma illofizii* n. sp. ♂. Scale bar: 0.1 mm

tips of the spines black. Tarsi beige pinkish. Arolia black and rounded not extending beyond the claws, the latter being black at the tip.

HABITAT

Meadow with *Astragalus* sp. and few *Juniperus* sp., in the upper limit of the Mediterranean montane storey (Ozenda 2002), near 1750 m a.s.l. (Figs 11-13). Seven other species of Orthoptera were encountered on the site: *Chorthippus scalaris* (Fischer von Waldheim, 1846); *Stenobothrus rubicundulus* Kruseman & Jeekel, 1967; *Pholidoptera femorata* (Fieber, 1853); *Saga hellenica* Kaltenbach, 1967; *Decticus verrucivorus* (Linnaeus, 1758); *Poecilimon zimmeri* Ramme, 1933; *Bucephaloptera bucephala* (Brunner von Wattenwyl, 1882); *Celes variabilis* (Pallas, 1771) and *Arcyptera microp-tera* (Fischer von Waldheim, 1833); the last four species are recorded here for the first time from Albania. The biotope seems currently not degraded by human activities. We noted the presence of moderate and localized grazing (small mixed units of sheep and goats).



FIG. 10. — *Peripodisma llofizii* n. sp. ♀. Paratype, side view. Body length: 25 mm.



FIG. 11. — Mt Llofiz, Albania.

DISCUSSION

As mentioned above, some morphological characteristics and details of coloration show that *Peripodisma llofizii* n. sp. is clearly different from *P. tymphii*.

P. llofizii n. sp. was discovered on a mountain at about forty kilometres (following roughly a line within an altitudinal range) of a locality where *P. tymphii* has been newly discovered in August 2014 on the border between the Albania and

Greece. There is no real geographical barriers between these two localities.

It is believed that the distribution of *P. tymphii* should extend over the entire Nemërçkës and Dhëmbelit mountain chains. Concerning *P. llofizii* n. sp., this species would be researched on Mount Lunxhërisë located Southeast, and even on Buretos Mt.



FIG. 12. — *Peripodisma llofizii* n. sp. ♂, on Mt Llofiz, Albania.



FIG. 13. — *Peripodisma llofizii* n. sp. ♀, on Mt Llofiz, Albania.

Although the localities of *P. tymphii* and *P. llofizii* n. sp. are not far from each other and are roughly located at same altitudes, their habitats are not similar.

The environment of *P. tymphii* consists of a subalpine meadow and the list of Orthoptera consists of typical species of the mountains of this region including: *Myrmeleotetix maculatus* (Thunberg, 1815), *Stenobothrus nigromaculatus* (Herrich-Schäffer, 1840), *Stenobothrus rubicundulus*, *Chorthippus scalaris*, *Psorodonotus fieberi macedonicus* Ramme, 1931; *Decticus verrucivorus* and *Gomphocerus sibiricus* (Linnaeus, 1767). *Gomphocerus sibiricus*, known for its typical boreo-alpine and thermophobic distribution, is widespread on the station, which clearly indicates the alpine affinities of the fauna found on this mountain.

In contrast, *P. llofizii* n. sp. station is more thermophilous. Its thermophily is further underlined by the presence of *Bucephaloptera bucephala*, *Saga hellenica* and especially *Pholidoptera femorata*. In the Balkans, the *P. femorata* is confined to the Mediterranean area and reached there, on the mountain of Llofiz, one of the highest altitudes where we could observe it.

The mountains of southern Albania show heterogeneous landscape, because of their particular geographical arrangement, in rows parallel to the sea with some higher and isolated mountains. It can then be hypothesized that the distinct environments, particularly related to various microclimate influences, rather than the geographical barriers and the distance between localities, may be responsible for speciation events within the genus *Peripodisma*. The presence of some elements of lower ecological valence in the populations of Orthoptera such as *Gomphocerus sibiricus* (mountain thermophile) in the *P. tymphii* locality or such as *P. femorata* (Mediterranean thermophilic) in the *P. llofizii* n. sp. locality seems a good indicator of the differences between these two mountains.

The genus *Peripodisma* can be linked to other *Podismini* of Europe. Based on morphological criteria, connections have first been established with *Cophopodisma* Dovnar-Zapolskij, 1932 and *Italopodisma* Harz, 1973 genus (Willemse 1972; La Greca & Messina 1979, 1982).

Recent molecular studies (Chintauan-Marquier *et al.* 2014) mention a distance from *Cophopodisma* genus, but confirm the close relationship with *Italopodisma*, endemic genus of the central Apennines (Kenyeres *et al.* 2009).

The research has to be continued, especially in the high mountains of this region, to better understand the evolutionary and biogeographic abilities of this genus.

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