



Distribution of harvestmen of the genus *Ischyropsalis* C. L. Koch (Arachnida: Opiliones) in Poland

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Abstract: Based on information from literature and new materials the distribution of the genus *Ischyropsalis* in Poland was studied. New data about *I. hellwigi* and *I. manicata* expand also information on habitat of these species and their vertical ranges.

Key words: *Ischyropsalis hellwigi*, *Ischyropsalis manicata*, vertical distribution, identification

INTRODUCTION

The genus *Ischyropsalis* C. L. Koch, 1839 is represented in the Polish fauna by two taxa: *Ischyropsalis hellwigi hellwigi* (Panzer, 1794) and *Ischyropsalis manicata* L. Koch, 1869 (Staręga 1976). Both species are very characteristic and easy to identify (Figs 1–2), but as they are notoriously difficult to find due to their soil-dwelling habits and presumed rarity their present distributions in Poland are poorly known. This actually applies to the postglacial relict *I. hellwigi* (Martens 1969, 1978, Staręga 1976), mentioned in Poland so far as several specimens from only few localities in Karkonosze (Riesengebirge) and other parts of Sudeten Mountains and isolated localities in Cracow-Częstochowa Upland (Rafalski 1961, Martens 1969, Sanocka-Woloszyn 1973, 1981, Staręga 1976, Rozwalka 2010). The distribution of *I. manicata* was known somewhat better. This species has been reported from nearly 20 localities in the Carpathians: from Silesian Beskides, through Tatra to Bieszczady Mountains (Staręga 1976, Martens 1978). The present study summarizes information about the occurrences of *I. hellwigi* and *I. manicata* in Poland based on data from literature. Additionally, new material collected mostly by the authors with pitfall traps (2005–2010) and by hand searching (1986–2011) is included.

DIAGNOSIS OF GENUS *ISCHYROPSALIS*

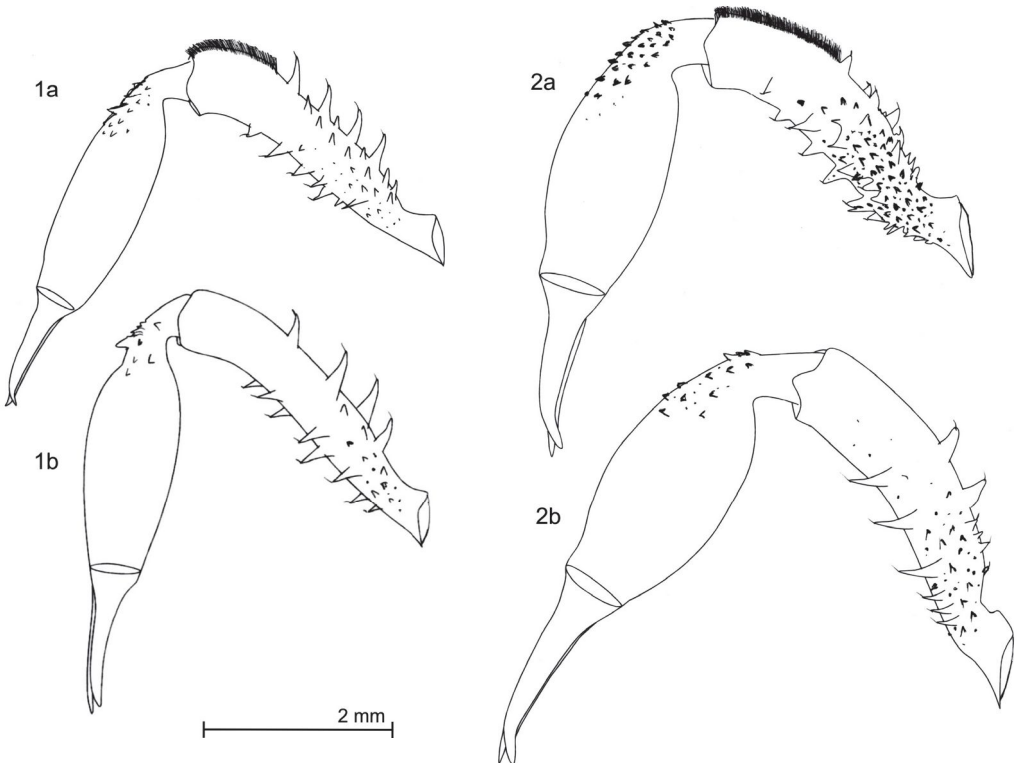
Body egg-shaped, uniformly black or brownish black (occasionally greyish). Dorsum mostly with scutum laminatum or scutum parvum (rarely scutum intermedium). Eyes separated by distinct furrow. Chelicerae very massive, distinctly longer than body, with numerous spines. Males with dorsal or dorsomedial field covered by setae in distal part of basal segment ("brush"). Female chelicerae provided with spines only. Pedipalps fairly long and thin. Legs of medium length, quite strong, unarmed. Coxa II–IV not adnate. Labium separated from sternum by distinct furrow, sternum small, about same size as labium. Penis club-shaped, glans clearly separated by often very numerous setae, stylus bent backwards. Ovipositor very short, not

segmented, with few setae in apical part, receptaculum seminis with numerous (4–10) finger-like ampullae, basally surrounded with funnel-shaped structure.

Copulative apparatus and other morphological characteristics of both species are fully described and illustrated in the papers of Šilhavý (1956), Martens (1969, 1978) and Staręga (1976).

KEY TO POLISH SPECIES

1. Chelicerae with dorsal „brush” on distal part of basal segment males (2)
- Chelicerae without dorsal „brush” on distal part of basal segment females (3)
2. „Brush” situated on dorsal side only, its length equal to about $\frac{1}{3}$ length
of this segment *I. hellwigi*
- „Brush” situated on dorsal and mediolateral side, its length equal to about 0.2 length
of this segment *I. manicata*
3. Dorsum with scutum laminatum *I. hellwigi*
- Dorsum with scutum parvum *I. manicata*



Figs 1–2. Chelicerae of *Ischyropsalis*, lateral view. 1. *I. manicata*: a – male, b – female. 2. *I. hellwigi*: a – male, b – female.

***Ischyropsalis hellwigi hellwigi* (Panzer, 1794)**

General distribution. Plains, foothills and medium-high mountains of Central Europe: S Netherlands, S and W Germany, W and C Bohemia, Austria, W Hungary, Croatia and Bosnia (Martens 1965, 1978, Novak 2005, Wijnhoven 2009). The second subspecies: *I. hellwigi lucantei* Simon, 1879, occurs in the Pyrenees (Martens 1969, 1978).

Recently appeared information about the occurrence of *I. hellwigi* in Southern Turkey (Kurt et al. 2008, Bayram et al. 2010 – as *I. taunica* Müller, 1923). The accompanying drawings (p. 656, figs 13–14), are very vague, but clearly show this is not *Ischyropsalis*. The shape and construction of chelicerae, point on a representative of the genus *Zachaeus* C. L. Koch (Phalangiinae)! Moreover, the distribution of the genus *Ischyropsalis* is generally considered to be limited to Southern and Central Europe (Martens 1978).

Distribution in Poland. Karkonosze (Riesengebirge) Mountains, other parts of Sudeten, southern part of Cracow-Częstochowa Upland (possibly isolated population – anyway no data from the “in-between” area) – altogether about 10 localities (Grube 1871, Lebert 1875, Fickert 1876, Roewer 1923, Bartoš 1938, Rafalski 1960, 1961, Martens 1969, 1978, Sanocka-Woloszyn 1973, 1981, Staręga 1976, Sanocka 1983, Rozwałka 2010).

New localities (all in Sudeten) (Fig. 3):

1 ♂: 16.08–6.09.2005, Izerskie Mts, forest insp. Świeradów, forest sec. 358d, ca 1080 m a.s.l., upper montane spruce forest at regeneration phase, pitfall traps, leg. A. Mazur, det. R. Rozwałka [WS 23].

1 ♂: 15.08–7.09.2005, Karkonosze National Park, protective district Szrenica, forest sec. 201d, ca 1200 m a.s.l., upper montane spruce forest bordering with peat bog spruce forest; pitfall traps, leg. A. Mazur, det. R. Rozwałka [WS 32].

4 ♂♂: 15.08–21.10.2005, Karkonosze National Park, protective district Przełęcz, forest sec. 139i, ca 1090 m a.s.l., upper montane compact spruce forest around 90 years old, pitfall traps, leg. A. Mazur, det. R. Rozwałka [WS 42].

2 ♂♂, 1 ♀: 7.09–21.10.2005; 1 ♂: 2.09–25.10.2006, Karkonosze National Park, protective district Przełęcz, forest sec. 150g, ca 1090 m a.s.l., upper montane spruce forest in renewal phase (approximately 15 years), pitfall traps, leg. A. Mazur, det. R. Rozwałka [WS 42].

6 ♂♂, 1 ♀: 15.08–7.09.2005, Karkonosze National Park, protective district Przełęcz, forest sec. 150h, ca 1040 m a.s.l., upper montane spruce forest decay phase of about 8-year-old brushwood, pitfall traps, leg. A. Mazur, det. R. Rozwałka [WS 42].

1 ♀: 8.09–8.10.2005, Śnieżnik Massif, Czarna Góra Mt, forest insp. Międzylesie, forest sec. 115a, ca 1200 m a.s.l., approximately 5-year-old culture of spruce with clumps of dwarf pine in alpine coniferous forest, pitfall traps, leg. A. Mazur, det. R. Rozwałka [XR 26].

1 juv.: 3.07–31.08.2005, Śnieżnik Massif, Czarna Góra Mt, forest insp. Łądek-Zdrój, forest sec. 339h, ca 1160 m a.s.l., upper montane spruce forest, pitfall traps, leg. A. Mazur, det. R. Rozwałka [XR 26].

2 ♂♂: 30.08–22.10.2005, Śnieżnik Massif, Śnieżnik Mt, forest insp. Łądek-Zdrój, forest sec. 288c, ca 1230 m a.s.l., sparse upper montane spruce forest, pitfall traps, leg. A. Mazur, det. R. Rozwałka [XR 36].

2 ♂♂: 30.08–22.10.2005, Śnieżnik Massif, Śnieżnik Mt, forest insp. Łądek-Zdrój, forest sec. 296a, ca 1230 m a.s.l., upper montane spruce forest, pitfall traps, leg. A. Mazur, det. R. Rozwałka [XR 36].

1 ♂: 30.06–30.07.2005; 1 ♂, 1 ♀: 30.07–8.10.2005, Bialskie Mts, Śnieżna Białka Wilderness; forest insp. Łądek-Zdrój, forest sec. 367b, ca 980 m a.s.l., transition zone between lower mountains sycamore-beech forest and upper montane spruce forest, pitfall traps, leg. A. Mazur, det. R. Rozwałka [XR 46].

***Ischyropsalis manicata* L. Koch, 1869**

General distribution. Carpathian species, living in medium-high mountains from the Moravian Gate to the Iron Gate: SE Moravia, S Poland, Slovakia, SW Ukraine, Romania (Šilhavý 1956, 1973, Martens 1969, 1978, Staręga 1976, Stašiov 1999, Bezděčka 2010).

Distribution in Poland (literature data). Silesian Beskides, High Beskides (Babia Góra Mt.), Western and High Tatra, Pieniny Mountains?, Bieszczady Mountains – altogether approximately 18 localities (Nowicki 1869, L. Koch 1870, Roewer 1914, 1923, 1950, Kowalski 1955, Rafalski 1960, 1961, Łomnicki 1963, Staręga 1966, 1976, 1979, Martens 1969, 1978, Sanocka 2003). Staręga (1979) believed that the species could become extinct in Pieniny Mts, because, despite intensive search in the 70s of the twentieth century, there was identified a trace of his presence – a single dry chelicera discovered in the 30s. Martens (1969) also reported Rogóźno near Rybnik as a locality of *I. manicata*. It is, however, doubtful, because at the time the material has been collected (1884, Guzy leg., ex coll. W. Kulczyński) this territory belonged to Germany and could not bear a Polish name. Now it is part of the town Żory (Germ. Sohrau) in Upper Silesia – a region seriously disturbed by the heavy industry [in 1884 the industry already existed and the changes of environment were considerable]. We could not trace any other locality in southern Poland fitting the mentioned name.

New localities (Fig. 3):

1 ♂: 4.07.2009, Western Tatra, Tatra National Park, Ciemniak Mt, under stones in the high mountain pasture a little below the peak, ca 2094–2095 m a.s.l., leg. R. Gosik, det. R. Rozwałka [DV 25].

1 ♀: 6.07.2008, High Tatra, Tatra National Park, Pięć Stawów Polskich Valley, dwarf mountain pine forest, under stone near Sikława waterfall, ca 1700 m a.s.l., leg. et det. R. Rozwałka [DV 35].

1 ♂: 2.09.1986, Gorce Mts, Ochotnica Górna-Jaszczce Małe, over Jaszczce stream, under stones, ca 850 m a.s.l., leg. W. Jędrzykowski, det. W. Staręga [DV 49].

1 ♂: 6.09–7.10.2007, Western Beskid Mts, Żmiącki stream valley, distr. Limanowa, mixed sycamore-beech forest, ca 760 m a.s.l., pitfall traps, leg. M. Szewczyk, det. R. Rozwałka [DA 60].

2 ♂♂, 1 ♀: 26.05–21.07.2010; 2 ♂♂: 21.07–18.08.2010, Bieszczady National Park, Połonina Caryńska Mt, mountain pasture, ca 1115–1120 m a.s.l., pitfall traps, leg. et det. R. Rozwałka [FV 14].

1 ♀: 26.05.2010, Bieszczady National Park, Połonina Caryńska Mt, S slope, beech forest, under stone, ca 870 m a.s.l., leg. et det. R. Rozwałka [FV 14].

1 ♀: 26.05–21.07.2010, Bieszczady National Park, Połonina Caryńska Mt, S slope, ca 860–870 m a.s.l., beech forest, pitfall traps, leg. et det. R. Rozwałka [FV 14].

1 juv.: 27.04.2011, Bieszczady National Park, Bukowe Berdo Mt, NE slope, ca 820 m a.s.l., beech forest, under stones, leg. et det. R. Rozwałka [FV 24].

1 ♂: 3–25.05.2010; 1 ♀: 25.05–18.07.2010; 2 ♂♂: 18.07–14.08.2010, Bieszczady National Park, piedmont peat-bog reserve Tarnawa, swamp pine forest, ca 642 m a.s.l., pitfall traps, leg. et det. R. Rozwałka [FV 34].

Localities published on maps by Staręga (1976) without documentation:

1 ♂, 4 ♀♀: 8.06.1967, Beskid Śląski Mts, below the peak Mała Czantoria, sycamore-spruce forest, in leaf litter and under stones, ca 700 m a.s.l., leg. A. Riedel, det. W. Staręga [CA 40].

1 ♀: 6.08.1964, Middle Beskid Mountains, Rytro near Nowy Sącz, Wielka Roztoka Valley, beech forest, in litter, leg. et det. W. Staręga [DV 78].

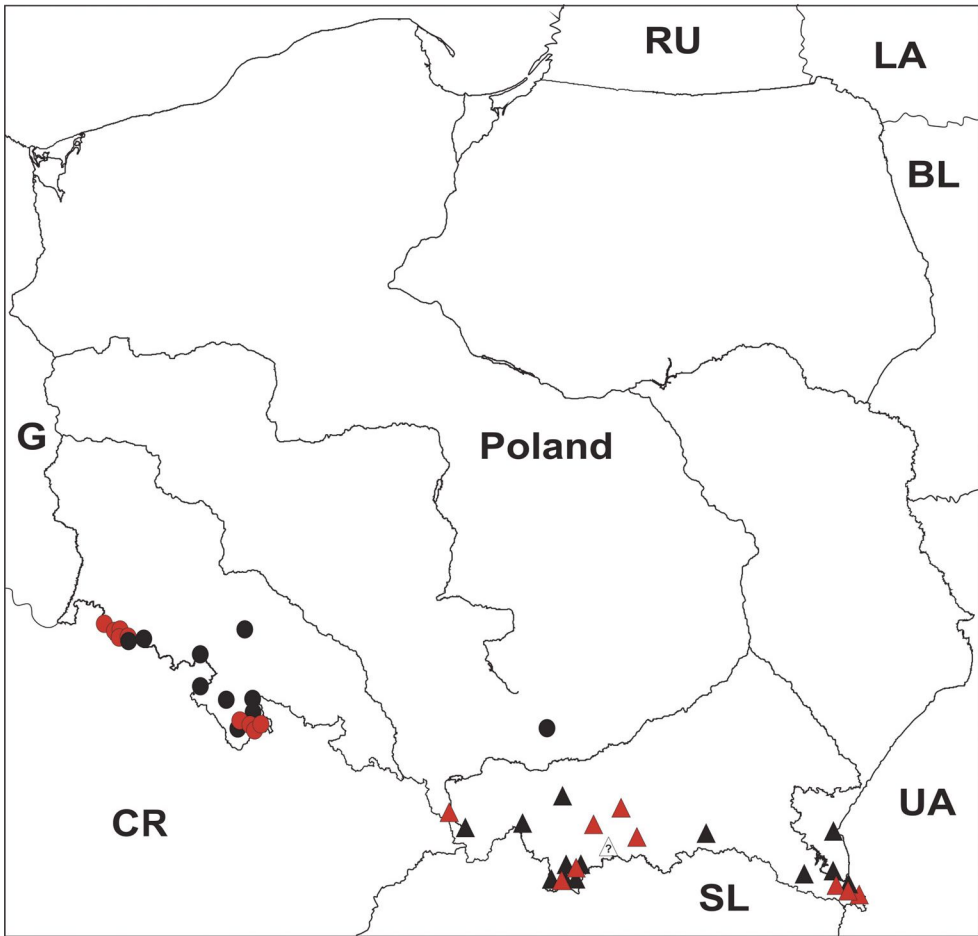


Fig. 3. Distribution of *Ischyropsalis* in Poland: circles – *I. hellwigi*, triangles – *I. manicata*; black – literature data, red – new records.

HABITAT, PHENOLOGY AND FOOD PREFERENCES

Ischyropsalis hellwigi is a postglacial relict species, occurring most often in environments characterized with low constant temperature and high humidity (Martens 1965, 1978, Starega 1976). This species is mostly caught in a cool mountain valleys and foothill streams under moist, rotting logs of wood, stones, in moist leaf litter or in caves (Martens 1965, 1969, 1978, Sanocka-Woloszyn 1973, 1981, Starega 1976, Bliss 1980, Baehr & Baehr 1985). Vertical distribution of this species covers the range from about 50 m above sea level in the Netherlands to 1900 m a.s.l. in the Austrian Alps (Martens 1978). In Poland the published records range from 250 to 650 m a.s.l. (Starega 1976). According to Martens (1969, 1978) it is a stenochronic species, occurring from late August to early November. According to Starega (1976) it is as eurychronic species (April–December). The exclusive food source of these harvestmen are shell snails: Zonitidae, Helicidae, Clausiliidae as well as shell-less slugs: Limacidae, Arionidae (Verhoeff 1900, Martens 1969, 1978, Starega 1976).

Ischyropsalis manicata occurs from lower forest zone to dwarf mountain pine, about 300 to about 1700 m a.s.l. (Staręga 1976, Martens 1978, Stašiov 1999, 2008). Like *I. hellwigi*, *I. manicata* was mainly caught in the valleys of streams, in damp, rotting wood logs, under rocks or in thick forest litter (Staręga 1976, Martens 1978, Sanocka 2003). In the Romanian Carpathians and Tatra Mountains the species was recorded from caves (Kowalski 1955, Avram 1964, Sanocka 2003). Adults occur over the whole year (Staręga 1976). Food preferences are probably similar to *I. hellwigi*, but because of the smaller body size (*I. manicata*: ♂ = 4.5–6.0, ♀ = 7.0–7.8 mm; *I. hellwigi*: ♂ = 5.6–6.8, ♀ = 6.8–8.5 mm), *I. manicata* may feed on comparatively smaller and more delicate shell snails (Martens 1965, 1978).

CONCLUSIONS

The present data supplement the information about occurrence of *I. hellwigi* and *I. manicata* in Poland. Particularly valuable are new localities of *I. hellwigi* found on the area of Karkonosze and other chains of Sudeten Mountains. Most data about this very rare species come from the time of second half of XIX century and beginnings of XX century (Lebert 1875, Fickert 1876, Roewer 1923, Bartoš 1938). Since those publication there were very few recent data confirming the presence of this species in Sudeten (Rafalski 1961, Staręga 1976, Sanocka 1983) and in Cracow-Częstochowa Upland (Sanocka-Woloszyn 1973). Moreover, the present localities of *I. hellwigi* move its vertical range in Poland from about 650 m to about 1230 m.

Our new findings on the vertical distribution of *I. manicata* are also of particular interest. So far, the highest reported findings were from Babia Góra Mountain (about 1700 m) (Rafalski 1961), Żółta Turnia Massif in the High Tatra Mountains (Łomnicki 1963) and from caves in the Western Tatra (Kowalski 1955, Sanocka 2003). Information from Slovakia (Stašiov 2008) and Romania (Avram 1964, Martens 1978) shows a similar maximum altitude reached by this species. Specimen caught in the stone rubble just beneath the peak of Ciemniak (Western Tatra), moves the border of vertical range to almost 2100 m a.s.l. Furthermore, our new data demonstrate that *I. manicata*, traditionally considered associated with mountain and submountain forests (or dwarf mountain pine forest), also penetrates into the high alpine pasture zone. Occurrence of *I. manicata* above the upper border of mountain forests is also confirmed by observations in the Bieszczady Mountains, where this species was recorded in the upper parts of Połonina Caryńska (1120 m a.s.l.).

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STRESZCZENIE

[Rozmieszczenie kosarzy z rodzaju *Ischyropsalis* C. L. Koch (Arachnida: Opiliones) w Polsce]

Praca omawia dotychczas znane rozmieszczenie i nowe stanowiska *Ischyropsalis hellwigi* *hellwigi* i *I. manicata* w Polsce. Ten pierwszy jest w kraju związany z Sudetami i Jurą Krakowsko-Częstochowską, drugi – z Karpatami, od Beskidu Śląskiego po Bieszczady. Nowe znaleziska znacznie rozszerzają pionowy zasięg obu gatunków: w przypadku *I. hellwigi* do 1230 m n.p.m. (dotychczas było 650 m), a w przypadku *I. manicata* do prawie 2100 m n.p.m. (dotychczas około 1700 m).

Accepted: 7 May 2012