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ON THE GENUS PROZERCON SELLNICK, 1943

Rod *Prozercon* Sellnick, 1943

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Při studiu půdních parasitiformních roztočů Československa se mi podařilo shromáždit větší počet zástupců velmi zajímavé čeledi Zerconidae. Byly mezi nimi jak formy známé, tak i nové druhy a řada vývojových stadií, jimž byla v literatuře dosud věnována malá pozornost. V této prvé části předkládám zpracování rodu *Prozercon*, obsahující popisy 4 nových forem a doplňující poznámky ke třem z Evropy dosud uváděným druhům.

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When investigating for several years the soil mesofauna, especially the parasitoid mites, I have succeeded in collecting a greater number of specimens representing the family Zerconidae Berlese 1892. In elaborating this family, I follow the relatively new work of Sellnick (1958). In his paper, a survey of the family Zerconidae, key to genera and species as well as descriptions of the species known till that time are given.

I found not only the described species, but also new forms, and further larval and nymphal stages, which have been often omitted. When studying some known species more profoundly I could ascertain further morphological details of the known species. For this reason, I think that the issues of my studies given in the following paper may be useful. Considering the extent of the collected material, I give in this first part a survey of the genus *Prozercon* Sellnick, 1943.

Prozercon Sellnick, 1943

Sellnick 1943 in Willmann, Arch. Hydrobiol. 40: 211
Sellnick 1944, Blätter für Milbenkunde 5: 40
Sellnick 1958, Acta zool. Acad. Sci. hung. 3: 362

Type: *Zercon fimbriatus* C. L. Koch, 1839

The detailed characteristic of the genus is given in Sellnick's last paper.

As for the taxonomic classification of the different species, the chaetotaxy and morphology of the dorsal side are of the utmost importance. The ventral side certainly gives very important generic characters, it was, however, not in use for the specific taxonomy and in descriptions. For completeness' sake I give an illustration of the ventral side of our most common species — *Prozercon kochi* (fig. 1 B).

As for the dorsal chaetotaxy, I follow the notation used by Sellnick (1958).

That is on the half-schematic picture of the species *Prozercon kochi* (fig. 1 A), where I give the notation of the hairs and pores. When examining the specimens more in detail, especially from the front and from the side, one can clearly see that the setae i 1 are situated closely above the gnathosoma, on

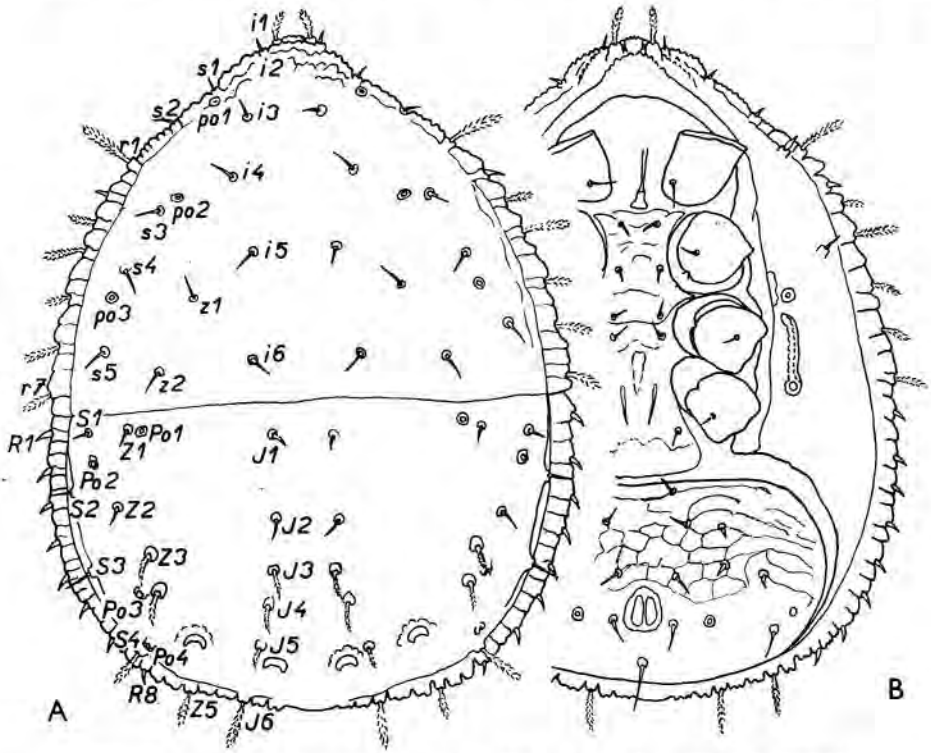


Fig. 1. *Prozercon kochi* Sellnick, A) dorsal, schematic, B) ventral

the ventral side, between three transparent wavy collarlike formations (see fig. 2 A, B, C). This fact has been reported by Evans (1957).

The sexual dimorphism is manifested only by the different structure of the ventral side and by smaller dimensions of the males. With regard to the more frequent occurence of females, I preferably describe females; as for males, I give dimensions only.

According to Sellnick (1958), three European species, namely *Prozercon fimbriatus, Prozercon kochi* and *Prozercon trägårdhi* and two American species belong to the genus *Prozercon.*

Schweizer (1948) described a species which he named *Prozercon willmani;* Sellnick considers it to be the variety *Prozercon kochi* v. *pluripennatus* described by himself.

Athias-Henriot (1961) has lately described a further new species *Prozercon aristatus* from Spain.

Two further species of this genus, *Zercon ornatus* Berlese 1904 and *Zercon columbianus* Berlese, 1910 have no more been found and their descriptions are short.

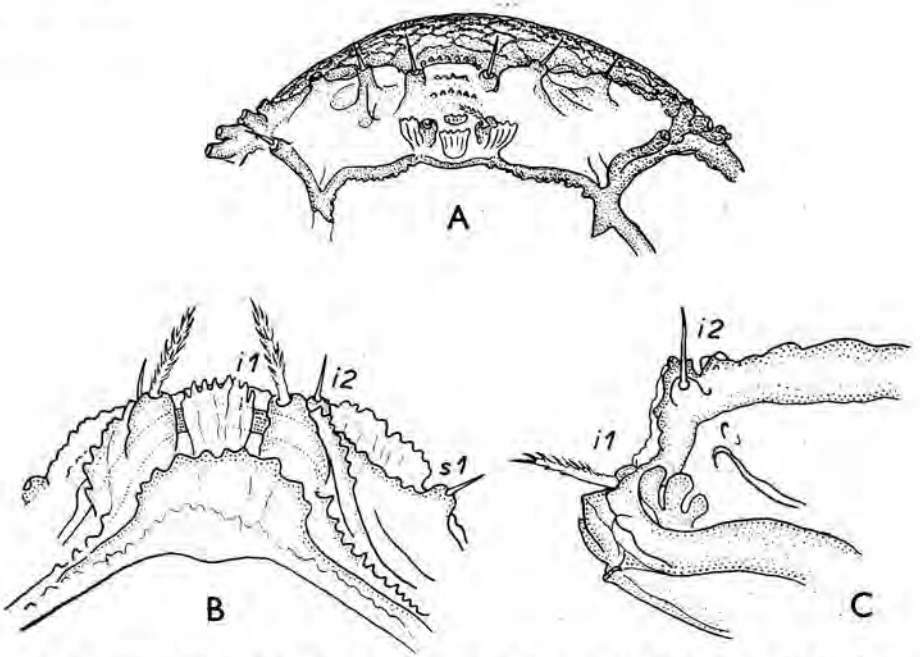


Fig. 2. *Prozercon kochi* Sellnick — anterior margin, A) front-view, B) back-view, C) side-view v — vertical setae

When studying the materials from Czechoslovakia I found — in addition to the species *Prozercon fimbriatus. P. kochi* and *P. trägårdhi* — four forms that could not be identified with any of the species known till that time. All these species may be determined according to the following key.

Key to European species

1. Setae on the notocephale (except vertical and margin setae, and sometimes setae z 2 and s 5) are smooth 2
— Setae on the notocephale (with the exception of setae i 4) are plumose . . . 6
2. Setae S 2 smooth, reaching either to the margin of the notogaster or insignificantly over it 3
— Seta S 2 plumose, long, strikingly reaching over the margin of the notogaster 4
3. Setae S 3, Z 1 and Z 2 smooth, short; seta z 2 does not reach to the posterior margin of the notocephale . . . . . *P. kochi* Sellnick, 1943
— Seta S 3 plumose, Z 1, Z 2 pilose, long; seta z 2 reaches over the posterior margin of the notocephale . . . . . *P. carsticus* n. sp.
4. Setae J 1, J 2, Z 1, Z 2 are smooth . . . *P. aristatus* Athias-Henriot, 1961
— Setae J 1, J 2, Z 1, Z 2 are plumose 5
5. Setae J 1 and J 2 are long, reach nearly to the insertions of the following pairs. Hairs z 2 and s 5 are pilose, setae i 2 and R 1 spine-like smooth. The depressions are conspicuous, having the shape of a half-moon . . . . . *P. fimbriatus* (C. L. Koch, 1839)
— Setae J 1 and J 2 are short, do by far not reach to the insertions of the following

pairs. Seae z 2 and s 5 are smooth, setae i 2 and R 1 are plumose. The depressions are not well conspicuous, their shape is round . . . . . *P. lutulentus* n. sp.

6. Setae R 1 plumose, S 1 shifted to row Z; the insertions of setae J 2 shifted extremely backwards, their distance from the setae J 1 being at least twice longer than that of J 2 —J 3 . . . . . *P. kunsti* n. sp.

— Seta R 1 thorn-like, S 1 not shifted to row Z, setae J 2 are not shifted extremely backwards. The distance of the insertions of setae J 1—J 2 and J 2—J 3 approximately the same 7

7 Insertions of all the setae on the notogaster, especially of those in rows J and Z are conspicuously raised wart-like. Setae of row J reach to the insertions of the following hairs, sometimes, they reach farther. Dimension of all depressions are the same. Hairs r 2 and r 3 reach to half the length of the other setae of row r . . . . . *P. trägårdhi* (Halbert, 1923)

— Insertions of the setae on the notogaster are not conspicuously raised wart-like, setae of row J, especially J 1 and J 2 do by far not reach to the insertions of the following hairs. The two marginal depressions are much larger than those in the middle. Hairs r 3 are as long as the other hairs of row r. *P. sellnicki* n. sp.

The variety *Prozercon kochi* v. *pluripennatus,* which was not at my disposal, was not taken into consideration when elaborating this key.

Prozercon kochi Sellnick, 1943 (fig. 1 A, B; 2 A, B, C; 3)

Prozercon kochi Sellnick, M., 1943, Arch. Hydrobiol. 40: 211—212
Sellnick, M., 1944, Blätter f. Milbenkunde 5: 41
Sellnick, M., 1958, Acta zool. Acad. sci. Hung. 3: 366, Fig. 58

For the sake of completeness I add some details (ascertained in my specimens) to the description made by Sellnick.

Female: length 318—350 μ, width 254—296 μ, average 335 × 272 μ
Male: length 260—281 μ, width 206—223 μ, average 272×215 μ

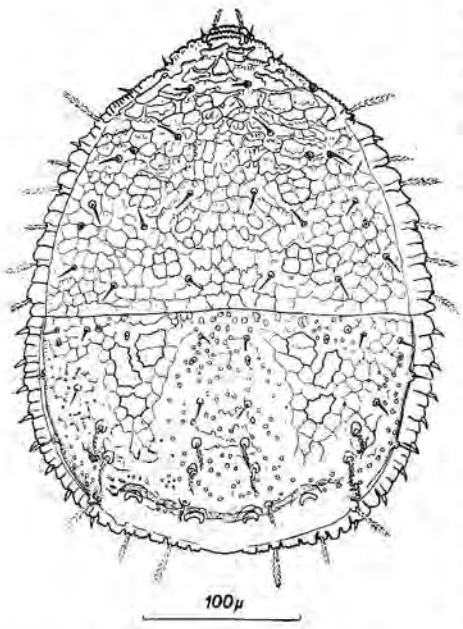


Fig. 3. *Prozercon kochi* Sellnick ♀

All setae on the surface of the anterodorsal shield are simple. The vertical and marginal hairs (except setae r 2) are feathered.

Pores po 1 lie under the insertion of hairs s 1, pores po 2 above the line joining i 4 — s 3, pores po 3 in the line connecting s 4 — z 2 nearer hairs s 4.

As to the hairs of the notogaster, all but setae J 1, J 2, Z 1, Z 2, S 1, S 2, S 3 are smooth; in distinction from the data given by Sellnick (1958), I have ascertained — when examining the specimens by means of a greater magnification — that setae J 3, J 4, J 5, Z 3 and Z 5 are pilose, while hairs J 6, Z 5 and S 4 are normally plumose.

Pores Po 1 are near the insertion of hairs Z 1 obliquely insidewards, pores Po 2 are below the insertion of seta S 1, pores Po 3 lie outside obliquely from the insertion of hairs Z 4 and pores Po 4 are situated closely above the insertion of seta S 4.

A description and illustrations of the deutonymph, as well as those of the protonymph are given in a paper by Halašková — Kunst, 1961: 28—29, fig. 12, 13. When examining more profoundly further deutonymphs of this species I have ascertained that the vertical setae and hairs i 2 are feathered. On the illustration of the protonymph (fig. 12 in the above named paper), there is a further mistake in representing setae i 3 as plumose, whereas they are quite smooth.

Localities:

(Owing to a great number of specimens found I give only the locality without any ecological data.)

Bohemia

Ore Mountains:
Hájek (Soos) peat-bog near Františkovy Lázně (435 m a. s. l.) 10. 10. 1957
Loučná (770 m a. s. l.) 30. 7. 1958
Cheb-basin:
Sítiny (Rauschenbach) (750 m a. s. l.) 29. 5. 1958
Bohemian Forest:
Domažlice — Babylon (440 m a. s. l.) 25. 4. 1957
Pilsen basin:
Dnešice and Lužany near Přeštice (350—370 m a. s. l.) 19. 2. 1957
Blatná (460 m a. s. l.) 2. 10. 1955
South Bohemia:
Velký Tisý (400 m a. s. l.) 24. 5. 1959
Central Bohemia:
Šárka (near Prague) (300 m a. s. l.) 23. 5. 1958
Strančice (440 m a. s. l.) 17. 7. 1959
Čelákovice (175 m a. s. l.) 23. 4. 1960
Ledce (near Mladá Boleslav) Melicharovský rybník (240 m a. s. l.) 23. 10. 1955
Jabkenice (250 m a. s. l.) 3. 10. 1961
Jizera Mountains:
Velká Jizerská louka (800 m a. s. l.) 27. 10. 1958
Czech-Moravian Highlands:
Česká Třebová, Kozlovský kopec (640 m a. s. l.) 24. 9. 1955
Polom (near Velká Střítež) 640 m a. s. l.) 2. 7. 1962
Velké Dářko (614 m a. s. l.) 2. 7. 1962
Staré Ransko (600 m a. s. l.) 2. 7. 1962
Skelné Hutě (685 m a. s. l.) 3. 7. 1962
Žákova hora (720 m a. s. l.) 3. 7. 1962
Špičák (near Jihlava) (700 m a. s. l.) 4. 7. 1962
Řídelov (700 m a. s. l.) 4. 7. 1962

Moravia

Beskydy Mountains:
Smrk (1282 m a. s. l.) 5. 9. 1957
Huti (near Staré Hamry) (500 m a. s. l.) 5. 9. 1957
Willmann (1939, 1954 and 1956) records the species from Kralický Sněžník and from the Moravian Karst.

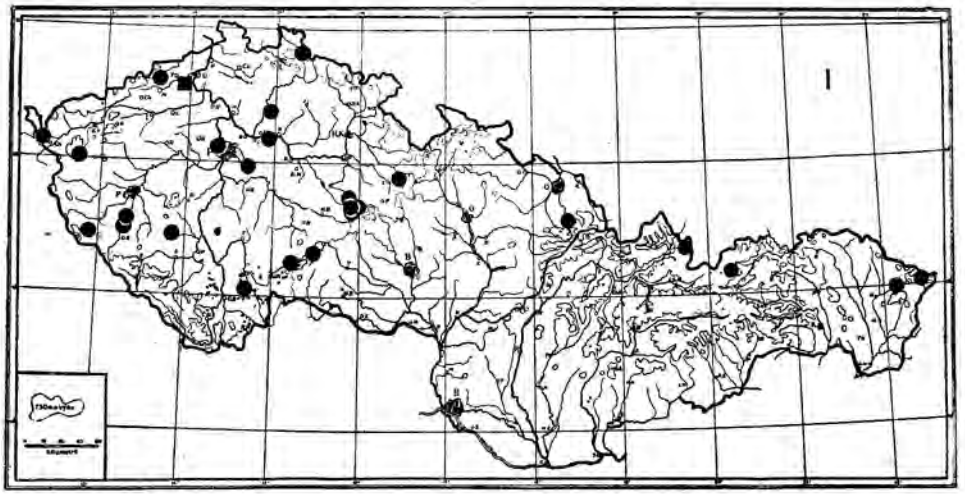
Slovakia

Orava:
Rudné (near Suchá Hora) (768 m a. s. l.) 4. 6. 1959
High Tatra:
Starý Smokovec (1050 m a. s. l.) 12. 11. 1960
Carpathians:
Rabia skala (1170 m a. s. l.) 10. 7. 1961
Kremeněc (900 m a. s. l.) 11. 7. 1961
Sninský kámen (1000 m a. s. l.) 6. 7. 1962

Distribution: Austria, Czechoslovakia, Germany, Poland, Sweden up to Lappland.

Ecology: According to data given by Willmann (1939, 1955, 1956) and Franz (1954) the species prefers rather more humid and more acid habitats with a higher humus content. It is especially often recorded from peat-bogs.

The finds from Czechoslovakia are predominantly from damp to humid raw humus of fir trees, in heathland, peatbogs, much less in deciduous woods. It is distributed abundantly all over the territory of Czechoslovakia.



Map I. Distribution of *Prozercon kochi* Sellnick (●) and *Prozercon lutulentus* n. sp. (■) in Czechoslovakia

Prozercon carsticus n. sp. (figs. 4, 5)

Female: length 323—340 μ, width 254—275 μ, average: 330 × 264 μ
Holotype: 328 × 254 μ
Male: 275 × 215 μ (Allotype), 270 × 217 μ

The antero-dorsal shield has a strikingly reticulated structure consisting of irregular areas bordered anterioly by a strongly sclerotized ledge, posteriorly by a thin line only.

The depressed areas between hairs i 4 — z 1 and s 3 as well as between hairs i 5, z 1, z 2 and s 5 are scarcely conspicuous.

All hairs on the surface of the notocephale are smooth and practically of the same length (on the average 19 μ with the exception of setae z 2, which are much longer).

The marginal setae are plumose, except hairs r 2; these are developed in the shape of short thornlike bristles. Setae r 1 and r 4 are long (32 μ and 29 μ), the remaining hairs are shorter.

Pores po 1 are not well conspicuous; they are placed under the insertion of seta s 1, pores po 2 are under the line joining i 4 — s 3, po 3 are on the line connecting s 4 — s 5.

The structure of the postero-dorsal shield anteriorly irregular, not much conspicuous; in direction towards the posterior, it goes into regular zones of

small areas which disappear at the end of the body. Between rows J—J', there are partly irregular thin lines, partly small grooves. Three spots are clearly conspicuous between the rows J—Z. Four depressions situated posteriorly on the body have the usual shape and position.

The setation of the notogaster is very strikingly various. The first two pairs of setae of row J are long (23 μ, 30 μ) and but shortly pilose, hairs J 3, J 4, J 5

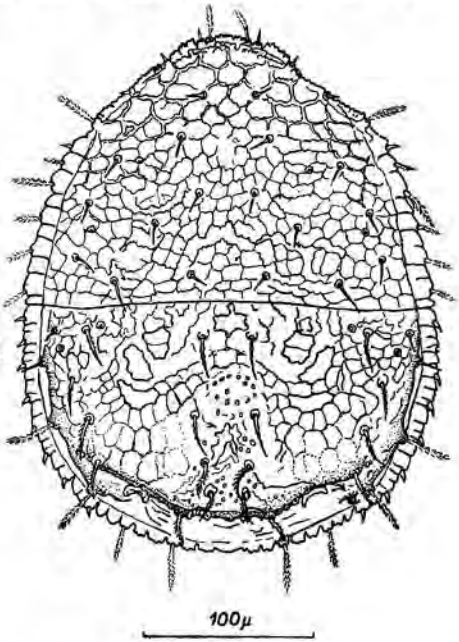


Fig. 4. *Prozercon carsticus* n. sp. ♀

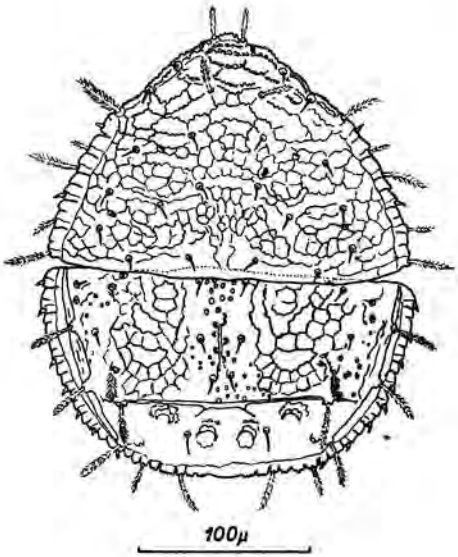


Fig. 5. *Prozercon carsticus* n. sp. deutonymph

are shorter and conspicuously plumose; the last pair J 6 is also plumose and belongs to the longest hairs on the notogaster.

Setae Z 1 and Z 2 are finely pilose (like J 1, J 2), the further pairs — Z 3, Z 4, Z 5 are normally feathered.

The first two pairs of row S are smooth, short, setae S 2 about twice longer than setae S 1. The remaining two pairs S 3 and S 4 are long, feathered.

The marginal setae R 1—R 8 are developed like short smooth thorns.

Pores Po 1 lie a little obliquely upwards on the inner side of the insertions of setae Z 1, pores Po 2 are situated on the line joining S 1—Z 2 nearer to S 1, to pores Po 3 on the line connecting the insertions of hairs S 3 with those Z 4 nearer to Z 4, and lastly pores Po 4 can be seen on the inner side of the insertion of hair S 4.

Deutonymph (fig. 5)

Measurements: 275 × 230 μ

Notocephale: The striking areas are bordered by fine lines. The position and shape of the setae on the antero-dorsal shield remind us of the chaetotaxy

of the deutonymph *P. kochi*. Except for setae of pair i 3, which are long and feathered, all the other hairs on the surface are short and smooth.

The marginal setae are directed obliquely forward and sideward. The hairs of rows r 2 and r 5 have the shape of smooth thorns, setae r 3 and r 6 are shorter (15 μ and 19 μ) and plumose, hairs r 1, r 4 and r 7 are long and feathered.

The position of the pores as in adult stages. The structure of the notogaster is concentrated first of all around three spots between rows J and Z; rows of areas are developed there. Between rows J—J' are scarce pits; some of them, especially those situated nearer to the centre, have the shape of a half-moon.

Setae J 1—J 5 are smooth, very short, hairs J 6 are long, feathered.

Setae Z 1 and Z 2 are short, smooth (8μ, 9 μ), hairs Z 3—Z 5 are longer, feathered.

Setae S 1 are extremely short, smooth, S 2—S 4 are long, plumose. The marginal hairs are developed like short simple bristles.

The position of the pores as in adult stages.

Remarks: The new species belongs to the group of species with smooth setae on notocephale (together with the species *P. kochi, P. fimbriatus* and *P. lutulentus.* It is closely related to the species *P. kochi.* It has a similar shape and position of hairs on notocephale, but differs from the species *P. kochi* in a number of important characters.

Whereas the species *P. kochi* has a row of quite smooth setae on the notogaster (J 1, J 2, Z 1, Z 2, S 1, S 2, S 3), all the setae on the new species are — except S 1 and S 2 — plumose, although it must be added that the plumosity of the two first members of row J and Z is weak.

When comparing the species belonging to this group as to the shape of hairs, we can place the new species between the species *P. kochi* and the species *P. fimbriatus,* but certainly nearer to *P. kochi.* It differs from it further by the length of the setae, too. Hair z 2 is longer than the corresponding seta in the species *P. kochi* and reaches to the posterior margin of the notocephale.

Setae J 1 and J 2 are at least twice longer than those of the species *P. kochi* and are finely pilose. Seta J 2 reaches to the insertion of the following hair; this fact has never been ascertained in the species *P. kochi.*

Setae Z 1 and Z 2 differ — in addition to their unlike shape — from the corresponding hairs in the species *P. kochi* in their at least double length.

These morphological differences of the two species are stressed by their unlike ecology. Whereas the species *P. kochi* prefers rather humid and acid habitats and is distributed over the whole territory, the new species was found only on three places in the South-Slovakian Karst.

Analogous differences exist also between the new species and the form described by Schweizer (1948) from Switzerland under the name *P. willmanni.* According to Sellnick, this species seems to be only a variety *P. kochi* v. *pluripennatus.*

The chief distinguishing character in which lies the difference between *P. willmanni* and *P. carsticus* n. sp. is the shortness of seta z 2 in the species *P. willmanni;* it does not reach over the margin of the anterior shield of dorsum.

Setae J 1, J 2 and Z 3 are (according to the illustration) much shorter than those of the just described species. Further, Schweizer draws the hairs of the notogaster as entirely smooth (except setae S 3, S 4, Z 5, J 6), whereas

all the hairs on the notogaster (except S 1 and S 2) of the new species are feathered, this plumosity being, however, very fine in some of them.

A further differential character is the relative position of the setae in rows J—J′. Whilst the lines joining the insertions of hairs J 2—J 4 and J 2′—J 4′ are convergent in the species *P. carsticus* n. sp., they are parallel or slightly divergent in *P. willmanni*.

Differences exist in the structure of the notogaster, too. *P. willmanni* shows small rounded pits between rows J—J′ like *P. kochi;* the new form has them considerably restricted by the division of the cuticle into irregular small areas.

As stated above, the new species differs from the species *P. fimbriatus* by the shape of the setae on the notogaster. The feathers or piles of setae on the notogaster are not so striking and some hairs (z 2, s 5 and S 2) are without them at all.

The insertions of the hairs, especially in row J are more striking in the species *P. fimbriatus* than in the new species.

There are differences in ecology and distribution (see map III), too.

Distribution: Czechoslovakia
Localities:

Slovakia

Slovakian Karst:

Zadiel Plateau (600 m a. s. l.) 22. 6. 1956, mixed deciduous woods, *Quercus, Cornus mas.* Leaf litter, dry (3 ♀♀)
Zadiel Plateau (770 m a. s. l.) 24. 6. 1956

a) Mixed deciduous woods *(Quercus, Cornus mas)* in meadows, undergrowth: *Corylus avellana,* ground layer: *Entodon schreberi.* Moss and leaf litter — 8 ♀♀, 2 ♂♂, 1 deutonymph.
b) At the same place. Leaf litter and humus horizon, humid — 1 ♀

Type locality: Zadiel Plateau 24. 6. 1956 a.
Ecology: The species was found in the xerothermous district of the Slovakian Karst in deciduous litter only.

Prozercon fimbriatus (C. L. Koch, 1839) (figs. 6; 7; 8 A, B)

Zercon fimbriatus Koch, C. L., 1839, A. M. S. — 27 : 7
Zercon trigonus Berlese, A., 1904 Redia 1 : 268
Zercon trigonus Berlese, A., 1915, Redia 10 : tab. 3, fig. 46
Zercon trigonus Halbert, J. N., 1915, Proc. Roy. Irish Acad. 31 : 80, Pl. VI, fig. 25
Prozercon fimbriatus Sellnick, M., 1943, in Willmann, Arch. Hydrobiol. 40 : 211
Prozercon fimbriatus Sellnick, M., 1944, Blätter für Milbenkunde : 40

Female I: length 345—360 μ, width 233—290 μ, average 356×278 μ
Female II*: length 350—360 μ, width 281—290 μ, average 354×286 μ
Male I: 286×233 μ, 296×222 μ
Male II*: length 275—292 μ, width 228—243 μ, average 285×235 μ.

All the notocephale divided into irregular areas; they are bordered by sclerotized ledges. Outward hairs i 5 and between setae i 6, z 1 and z 2, there are impressed irregular areas divided into smaller areolae.

The hairs on the notocephale posteriorly growing longer, smooth with the exception of pairs z 2 and s 5 that are finely pilose. This distinguishing character has not been recorded in the available literature; it is conspicuous when making use of considerable magnifying.

As to marginal setae, hair z 2 is developed like a short thornlike bristle.

* specimens with one inserted seta between hairs J 4.

Pores po 1 lie closely under the insertion of hairs s 1, pores po 2 on the line joining insertions i 4 with s 3, pores po 3 are situated between the insertions of setae s 4 — s 5 in inward direction.

Notogaster: Small, irregular pits are conspicuous between the J—rows; the three usual irregular areolae are in a oblong grooved hole. Four depressions on the posterior of the body have the shape of a halfmoon with a wary-like upper border.

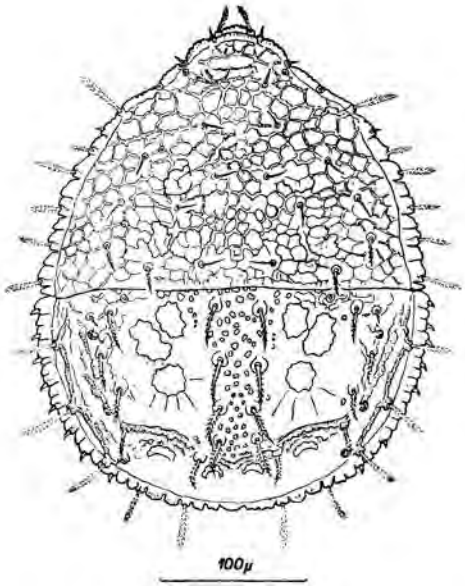


Fig. 6. *Prozercon fimbriatus* (C. L. Koch) ♀

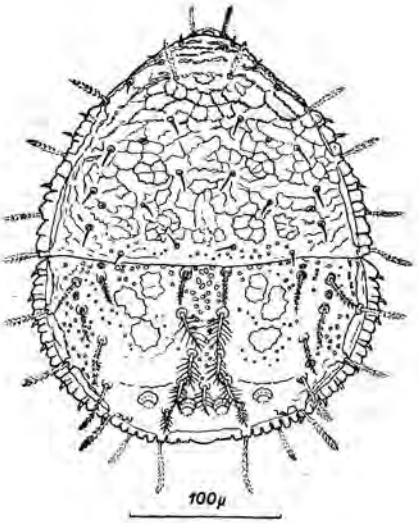


Fig. 7. *Prozercon fimbriatus* (C. L. Koch) deutonymph II

With the exception of setae S 1, the hairs on the notogaster are plumose; hair S 1 is very short, it lies on the same line as seta Z 1. Hairs S 2, S 3, S 4 are long, plumose, reaching by a larger part of its length over the margin. The hairs of row J are long (J 1—37 μ, J 2—37 μ, J 3—35 μ), conspicuously, plumose.

According to Sellnick (1958), there are — in addition to specimens with normally developed hairs — also some further individuals with a seta inserted between hairs J 4. If I may judge from my finds, individuals with this character occur much more often than individuals with normally developed hairs. These individuals with an additional seta were found five times oftener than specimens without it. It has not been for the time being, possible to ascertain the correlation of the occurence of this anomaly to the outer conditions. There were both forms found together in some samples. It is interesting that there is a conspicuous difference in the deutonymphs, too; this difference lies not only in the occurence of an additional hair J 4", but also in that the feathers of setae J 2—J 4 are considerably longer and their axes and the axis of seta include a broader angle.

Deutonymph I (fig. 8 A)

Measurements: 286 × 233 μ, 293 × 222 μ

The notocephale is reticulated. The reticulation is more conspicuous in the anterior. The areas between hairs i 4, i 5, and s 3 as well as the areolae between setae i 6, z 1, z 2, s 5 are clearly visible.

In addition to the vertical setae, the plumose hairs are only the setae i 3; rows z and s have simple bristles. The marginal setae r 1 are very long, plumose, r 2 and r 5 are short simple thorns, r 3 are very short and plumose, r 4, r 6, r 7 are of about the same length and plumose.

The distribution of the pores on the notocephale, as well as on the notogaster is the same as in the adult stage.

The same can generally be said about the structure and distribution of the hairs on the notogaster. Hair S 1, however, is long and plumose.

Deutonymph II (fig. 7)

Deutonymphs of the anomalous specimens (with an "additional" seta J 4) were found in two localities. These deutonymphs differ from the normal deutonymphs in a number of characters.

Measurements: 286 × 230 μ, 290 × 238 μ, 296 × 250 μ

Notocephale: The sculpture is a little more striking. The setae of row — i are rather longer. This can be seen especially well when comparing the length of hair i 3 (deutonymph I : 19 μ, deutonymph II : 30 μ).

Notogaster: The setae of row J are longer and quite different (deutonymph II : J 1 = 27 μ, J 2 = 32 μ), whilst deutonymph I : J 1 = 21,5 μ, J 2 = 24 μ).

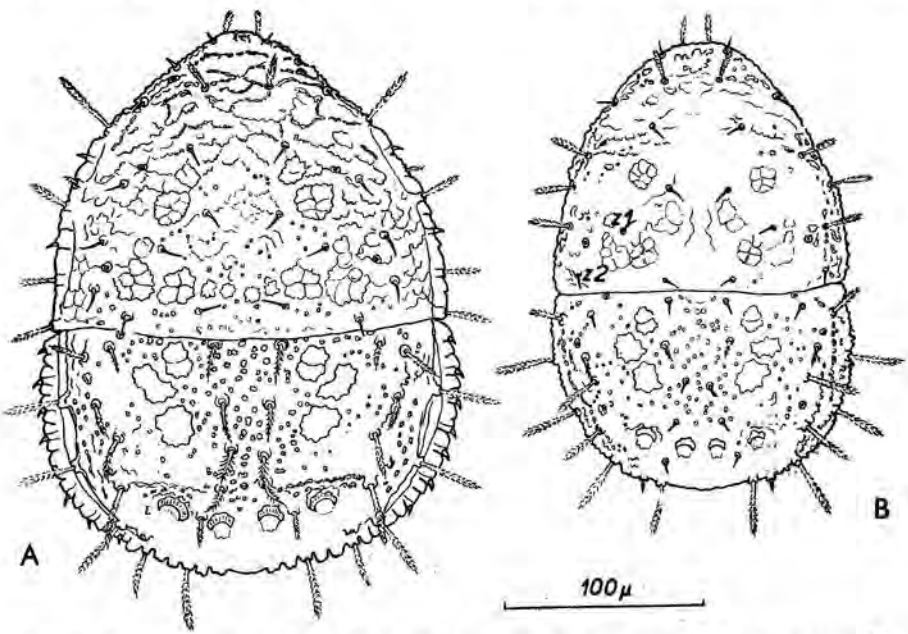


Fig. 8. *Prozercon fimbriatus* (C. L. Koch) A) deutonymph I, B) protonymph

The insertions of hairs J 1—J 1′ are situated more closely to one another (30 μ, deutonymph I : 35 μ). The further pairs J 2, J 3, J 4, J 5 are longer and very plumose. There is also a further seta J 4″ situated between hairs J 4—J4′ (as in adult stage). The setae of row Z are longer (Z 1 : 21 μ, Z 2 : 27 μ, Z 3 : 34 μ, Z 4 : 39 μ, Z 5 : 27 μ; deutonymph I : Z 1 : 17 μ, Z 2 : 19 μ, Z 3 : 27 μ, Z 4 : 36 μ, Z 5 : 27 μ).

Protonymph (fig. 8 B)

Measurements: 240 × 160 μ

The structure of the notocephale is almost not conspicuous. The initial formation of the areolae is indicated by a few thin lines in the anterior. One can better see the round areas near the insertion of setae i 5 and between hairs i 6 and z 1. Row i has all its setae (i 3 are long and plumose). As for the hairs of row z, setae z 1 and z 2 are developed and hair z 2 is shifted a little sideward (see protonymph of *P. trägårdhi)*.

All the surface of the notogaster is superficially pitted; the pits are crowded more together between rows J—J′. In the oblong groove between rows J—Z, the spots are conspicuous.

With the exception of the marginal setae all the hairs of the notogaster are developed. The setae of row J are very short, hairs J 2, J 3, J 6 are conspicuously pilose. Hairs Z 1 are short and smooth, Z 2 short and pilose, Z 3 and Z 4 plumose and long, reaching over the margin of the body (Z 3 by a quarter, Z 4 by half its length). Seta Z 5 is very short and pilose. The hairs of row S are long and plumose.

Distribution: Germany, Switzerland, Austria, Northern Italy, Spain, Algieria, hintherto not recorded from Czechoslovakia.

Localities:

(Because of a great number of specimens found I give only the locality without any ecological data.)

Bohemia

Bohemian Forest:
- Domažlice — Babylon (440 m a. s. l.) 25. 4. 1957
- Hojsova Stráž — Jezerní stěna (845 m a. s. l.) 1. 9. 1957

Bohemian Central Mountains:
- Lovoš (400 m a. s. l.) 30. 4. 1959
- Boreč (400 m a. s. l.) 30. 4. 1959
- Kundratice (600 m a. s. l.) 19. 6. 1959

Central Bohemia:
- Mšec (near Nové Strašecí) (450 m a. s. l.) 21. 5. 1960
- Koda (350 m a. s. l.) 6. 5. 1959
- Točník (450 m a. s. l.) 20. 2. 1958
- Baba (near Kosmonosy) (350 m a. s. l.) 22. 6. 1962

South Bohemia:
- Velký Tisý (400 m a. s. l.) 24. 5. 1959

Giant Mountains:
- Pančická louka (1390 m a. s. l.) 26. 9. 1958

East Bohemia:
- Peliny (near Choceň) (300 m a. s. l.) 15. 8. 1956

Jizera Mountains:
- Velká jizerská louka (650 m a. s. l.) 24. 10. 1958

Czech-Moravian Highlands:
- Staré Ransko (600 m a. s. l.) 2. 7. 1962
- Šindelný vrch (790 m a. s. l.) 3. 7. 1962
- Žákova hora (800 m a. s. l.) 3. 7. 1962

Loučky — Špičák (700 m a. s. l.) 4. 7. 1962
Roštejn (near Třešť) (675 m a. s. l.) 4. 7. 1962
Řídelov — Nová Ves (700 m a. s. l.) 4. 7. 1962.

Moravia

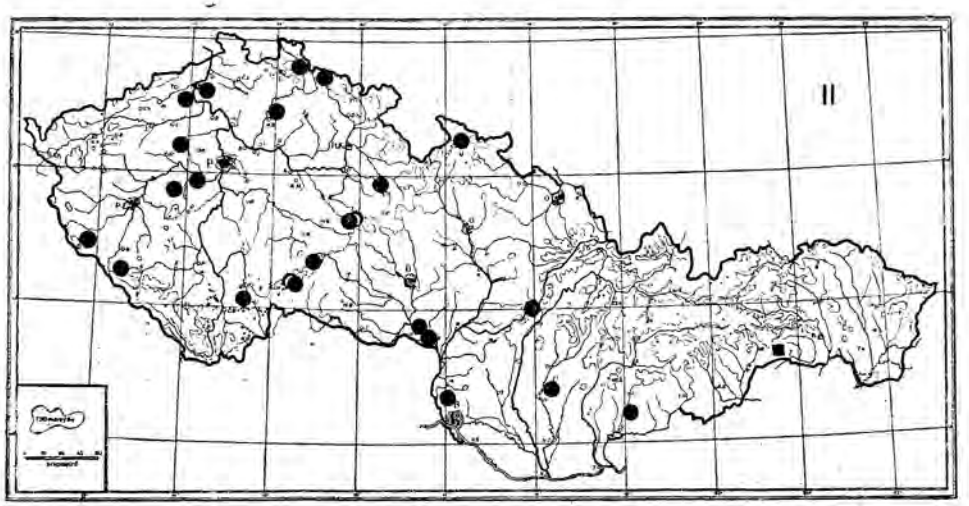
Rychlebské Mountains:
Dolní Lipová — Pomezí, Vápenice — cave (550 m a. s. l.) 27. 1. 1959
South Moravia:
Lednice, Hlohovecký rybník (170 m a. s. l.) 16. 6. 1961
Pavlovské vrchy, Klentnice (400 m a. s. l.) 19. 6. 1958
White Carpathians:
Hrozenkov (350 m a. s. l.) 13. 6. 1962

Slovakia

Little Carpathians:
Lozorno (190 m a. s. l.) 11. 6. 1962
Krupina Hills:
Plášťovce (300 m a. s. l.) 12. 6. 1962
Tribeč Mountains:
Nitra — Zobor (280 m a. s. l.) 13. 6. 1962

Ecology: According to references and my own finds, the species *P. fimbriatus* is an euryokous species. It occurs in dry up humid biotopes with a different humus content. It seems to be indifferent to pH.

It Czechoslovakia, it was found more abundantly in deciduous as well as in pine forests at places with a higher humus content.



Map II. Distribution of *Prozercon fimbriatus* (C. L. Koch) (●) and *P. carsticus* n. sp. (■) in Czechoslovakia

Prozercon lutulentus n. sp. (fig. 9)

Female: length 355 μ width 255 μ

The notocephale has a reticulated texture consisting of irregular areas. All the setae on the surface of the antero-dorsal shield (with the exception of i 1 and i 2) are smooth, thornlike, markedly tapering towards the hair-tip.

All the marginal hairs r 1 — r 7 are plumose, setae r 2, r 3 and r 5 are shorter than the others.

The pores po 1 lie under the insertion of seta s 1, po 2 are situated on the line joining i 4 — s 3, po 3 are to be found on the line connecting s 4 — s 5, nearer to s 4.

The structure of the notogaster is irregular, only slightly noticeable, wholly disappearing sidewards and backwards.

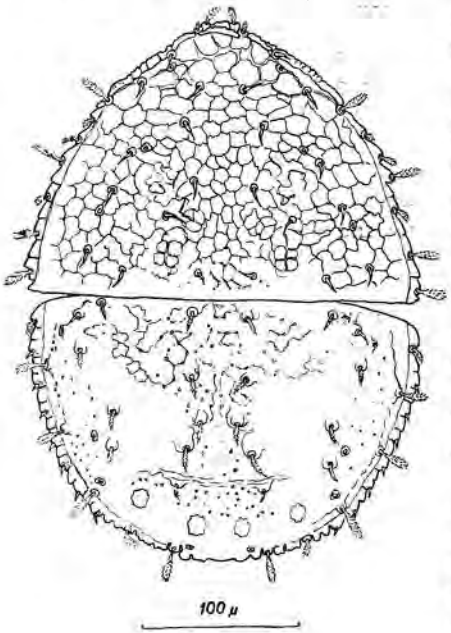


Fig. 9. *Prozercon lutulentus* n. sp. ♀

The four depressions on the posterior of the body are only slightly visible and of a round shape.

All the setae of the notogaster are relatively short (except the first pair of the s-row), plumose; they are situated on elevated papillae. The insertions of hairs J 3 — J 3' are nearer to one another than the remaining insertions; they are shorter and are situated considerably higly over the depressions.

The setae S 1 are smooth and short, S 2 — S 4 are long and reach over the border of the notogaster.

The marginal setae are shortly thorn-like except R 1, which is shorter and plumose.

Pores Po 1 are very little conspicuous and are placed between the insertions of setae Z 1 and S 1, Po 2 outside the line connecting S 1 — S 2, Po 3 outside the line joining the insertions Z 3 — Z 4, Po 4 above the insertions of the setae S 4.

Remarks: The new species belongs to the group of species with smooth setae on notocephale (together with the species *P. kochi, P. carsticus* n. sp. and *P. fimbriatus)*.

However, it takes a particular position here: the setae i 2, r 2 and R 1 are plumose, whilst the other species of this group have smooth hairs in these rows. By these characters, it comes nearer to the forms of the second group (see the concluding remarks). The reticulated structure is much less developed, the depressions are round and only very little conspicuous.

Distribution: Czechoslovakia

Locality: Bohemian Central Mountains: Boreč (400 m a. s. l.) 30. 4. 1959. Scanty oak-wood *(Quercus pubescens)*, tussocs of grass, soil on roots, dry — 1 ♀

Prozercon sellnicki n. sp. (figs. 10, 11)

Female: length 296—328 μ, width 223—249 μ average 312 × 237 μ, Holotype 318 × × 244 μ

Notocephale has the usual sculpture of areas anteriorly with stronger bordering ledges. The areas are posteriorly smaller and their border ledges are finer. The clearly conspicuous round spots with an amplified border are under setae i 5.

All the setae on the notocephale — except hairs i 5 — are plumose. This plumosity is especially striking on the marginal setae and on hairs i 3. The seta r 2 is very short.

Pores po 1 are situated under the insertion of hairs s 1, pores po 2 lie inside the line connecting the insertions of setae s 2 — s 3, pores po 3 are outside the line joining the insertions of hairs s 4 — s 5.

Notogaster is pitted between rows J—J', as well as outside the named rows. The surface between rows J—Z is provided with spots; the spots lie in a shallow groove.

A very striking character (when compared with other species of the genus) is the shape and position of the depressions. The outer depressions are much larger than the inner ones and the axes of all these depressions are posteriorly convergent.

All the hairs on the notogaster are feathered. These are setae S 2, S 3, S 4, Z 5 and J 6 where the plumosity is most striking.

The position of pores: pores Po 1 lie outside the insertion Z 1. Pores Po 2 are shifted markedly to the margin of the body and lie about the same line as S 1. Pores Po 3 lie obliquely outside insertion Z 3. Pore Po 4 is situated under the outer margin of the great depression and is very little conspicuous from above.

Deutonymph (fig. 11)

Measurements: 265 × 206 μ

The deutonymph differs from adult stages — apart from dimensions — by a less striking sculpture and by shorter setae on the surface of the notocephale. Further, hairs z 1, z 2 and i 6 are smooth, whereas in the adult stage they are feathered.

Remarks: *P. sellnicki* n. sp. belongs to the group of species the dorsal side of which have plumose hairs (with the exception of setae i 5). It differs

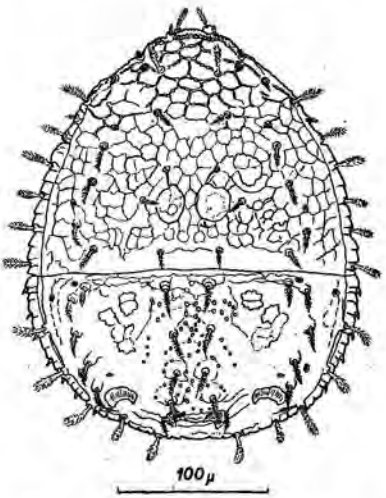


Fig. 10. *Prozercon sellnicki* n. sp. ♀

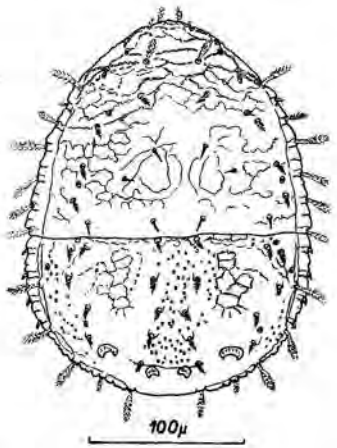


Fig. 11. *Prozercon sellnicki* n. sp. deutonymph

from the species *P. trägårdhi* as well as from the just described species *P. kunsti* n. sp. first of all by the size and position of the depressions on the notogaster. Whilst both named species have all depressions of the same size and their axes are parallel or divergent, the outer depressions of the new species are of a greater size and their axes are convergent.

The new form compared with the species *P. trägårdhi* has a smaller size (average 312 × 365 μ); the hairs are shorter, too (measurements in μ):

	P. sellnicki n. sp.	*P. trägårdhi*
i 5	14	27
z 2	18	28
s 5	18	27
J 3	18	35
Z 2	17	32

The insertions of the hairs are never lifted knob-likely as in the species *P. trägårdhi.*

The hairs i 6 and z 2 reach hardly to the margin of the notocephale or reach over it only a litle, whereas they reach over it by half their length in the species *P. trägårdhi.* As to the marginal hairs, hair r 2 is shorter, whilst the species *P. trägårdhi* has shorter setae r 2 and r 3.

There are clear differences in the position of pores in both species. Pore po 3 of the new species lies outside the line connecting s 4 — s 5, the same pore of the species *P. trägårdhi* lies inside. Pores Po 1 of the new species lie outside the insertion of hair Z 1, the same pores of the species *P. trägårdhi* above this seta. Pore Po 2 is shifted strikingly sideward in the new species, the same pore lies on line joining S 1 — Z 2 in the species *P. trägårdhi.*

The sculpture of the new species is much less striking; the sclerotized line connecting hairs Z 4 — J 5 — J 5′ — Z 4′ of the species *P. trägårdhi* is absent.

The species *P. sellnicki* n. sp. differs from a further newly described species *P. kunsti* n. sp. — in addition to the above named differences — by the not reduced hair r 3, by the regular distance between hairs J 1 — J 2 — J 3, by the smoothness of seta R 1, by the normal position of hair S 1 (hair S 1 of the species *P. kunsti* n. sp. is shifted into row Z) and by the position of pores po 3, Po 1 and Po 2.

The deutonymph of the new species is different too. Besides some characters named above, which are the same in the adult stages as well as in the deutonymph, the setae z 1, z 2 and i 6 are smooth.

Distribution: Czechoslovakia
Localities:

Bohemia

Ore Mountains:
Sítiny (Rauschenbach) (750 m a. s. l.) 29. 5. 1958
a) Heathland (*Erica*-shrubs). Moss, litter of *Erica* and soil, a thin layer on serpentine ground — 4 ♀♀, 1 deutonymph
b) Heathland. Lichen and moss on raw humus (2 cm), dry — 4 ♀♀

Bohemian Forest:
Hojsova Stráž — Jezerní stěna (845 m a. s. l.) 12. 6. 1958. Meadow in fir forest, bushes of *Juniperus communis,* shrubs of *Vaccinium vitis-idaea, V. myrtillus.* Moss, litter of shrubs, raw humus horizon on gravel ground, humid — 4 ♀♀

Czech-Moravian Highlands:
Staré Ransko (600 m a. s. l.) 2. 7. 1962. Mixed forest (fir, beech), in under-

growth: beech, *Epilobium*. Litter and raw humus (2 cm), humus layer (2—4 cm), humid — 3 ♀♀

Type locality: Bohemian Forest: Hojsova Stráž

Ecology: The species *P. sellnicki* n. sp. was found not abundantly at lower montane altitudes of the Bohemian massif, in litter of *Erica* and *Vaccinium*, of mixed forests or in moss, lichen on soil with shallow humus horizon.

Prozercon trägårdhi (Halbert 1923) (figs. 12, 13, 14)

Zercon trägårdhi Halbert, J. N., 1923, J. Linn. Soc. 35 : 375, Pl. 21, fig. 15 a, b
Prozercon trägårdhi Sellnick, M., 1958, Acta zool. Acad. sci. hung. 3 : 364, fig. 56

Female: length 355—376 μ, width 238—275 μ; average 367 × 257 μ
Male: length 286—307 μ, width 207—222 μ; average 298 × 214 μ

The dimensions correspond to sizes given by Sellnick from Germany and by Halbert from Ireland. The surface of the notocephale is divided into irregular small areas. They are bordered by strong waved ledges, as stated in the description by Sellnick. Posteriorly, the areas are smaller and the border ledges have the shape of fine, wavy lines.

Oval spots are below hairs i 5. These formations are bordered marginally by a strong ledge. Further less conspicuous oval areas are situated above hairs z 1. Below hairs z 1, there are square areolae, which can be seen more conspicuously in immatural stages.

All the hairs, except setae i 5 — are plumose.* Their insertions — especially on the shield — have the shape of small round knobs. They are relatively long (i 6 = 27 μ, z 2 = 28 μ, s 5 = 27 μ). The hairs i 6 and z 2 reach considerably over the posterior margin of the notocephale, much more than in the illustration given in the work of Sellnick (1958 — fig. 56).

Pores po 1 are situated closely under the insertion of hairs s 1. Pores po 2 are on the line joining the insertions of hairs i 4 to those s 3; pores po 3 lie on the inner side of the line connecting insertions s 4 — s 5.

Nearly all the surface of the notogaster is reticulated. Its sculpture is made by small, depressed areas of irregular shape. Their borders are strongly sclerotized. This corresponds to the illustration by Halbert.

The hairs on the notogaster are relatively long, plumose (Halbert and Sellnick give them far shorter). That applies to the specimens from Czechoslovakia as well to the forms from Germany (J 1 = 32 μ, J 2 = 35 μ, J 3 = 35 μ, Z 1 = 29 μ, Z 2 = 32 μ). Their insertions rise above the surface droplike. This has not so far been stressed, although it is a very striking phenomenon.

The marginal setae R 1 — R 8 are developed as short bristles.

Pores Po 1 lie nearly above the insertion of hair Z 1, pores Po 2 are situated on the line connecting S 1 — Z 2, pores Po 3 lie outside the line joining the insertions of the hairs Z 3 — Z 4, pores Po 4 at the usual place near the insertion of hair S 4.

Deutonymph (fig. 13)

Measurements: lenght 307—318 μ, width 206—277 μ, average 3×217 μ.

The notocephale of the deutonymph is practically corresponding to that of

* There have been found three aberrant specimens from the Czech-Moravian Highlands with smooth setae z 1 and with not well markedly pilose setae i 6; these last named hairs are very short and do not reach over the posterior margin of the notocephale.

the female, but its sculpture is lees conspicuous, having simple border-lines. The areas between hairs i 5 and s 3 as well as between setae i 6 and z 1 are clear enough to be well seen.

The pilose setae of rows i, and z are considerably shorter than the corresponding hairs of adult individuals. As to marginal hairs, the setae r 5 are shorter, too (in addition to hairs r 2 and r 3).

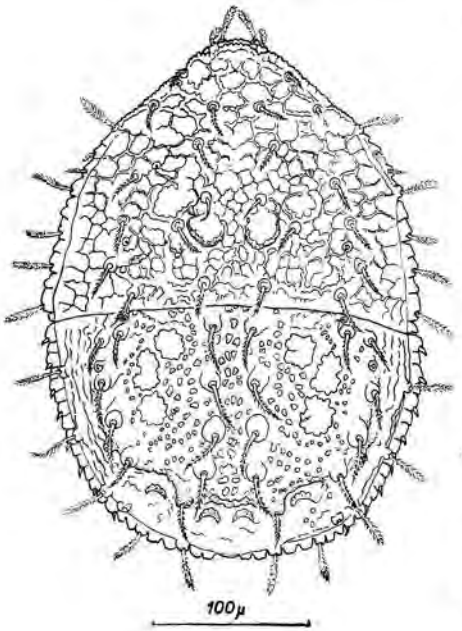


Fig. 12. *Prozercon trägårdhi* (Halbert ♀

The notogaster is almost of the same shape as the posterior shield of the adult individual; the setae of rows J, Z and S are, however, a little shorter.

Protonymph (fig. 14)

Measurements: 227 × 143 μ

The notocephale shows only a very slight scultpure; the round spots below the insertions of setae i 5 and the square areolae between the setae z 1 and i 6 are relatively well conspicuous.

As for the hairs of the notocephale, all the setae of row i are developed. The seta i 3 is much bigger than the other setae of the same row. In the course of further development, this pair of setae grows shorter, as one can see in the pictures of the deutonymph. Both members of row z are developed. When comparing the protonymph with the deutonymph and with the adult stage, seta z 2 is shifted a little sidewards so that is could be taken for seta s 5. This, however, must be excluded regarding its position toward pore po 3 (see fig. 14); seta s 5 is always situated obliquely sidewards, near the named pore.

As for the hairs of row r, the humeral r 1 is developed.

The notogaster has a relatively conspicuous sculpture; there are three spots in a groove between rows J and Z.

Except the marginal setae, all the hairs are developed. All are plumose and their insertions are elevated wart-like. The setae S 2, S 3, S 4, Z 4 and J 6 are relatively long regarding the smaller dimensions of the specimen, they are nearly as long as the corresponding hairs of the deutonymphal and adult stages. On the other hand, setae Z 1, S 1 and especially hair Z 5 are much shorter.

Remarks: *P. trägårdhi* belongs to the group of species that have all the setae on the notocephale plumose except hairs i 5. It is distinguishable from the other species of this group (*P. sellnicki* n. sp. and *P. kunsti* n. sp.) by the well conspicuous wart-like insertions.

Distribution: Ireland, Sweden, Germany, Switzerland; not yet recorded from Czechoslovakia.

Localities:

Bohemia

Pilsen basin:

Blatná (460 m a. s. l.) 2. 10. 1955. Fir forest with an admixture of oak. Litter of oak and raw humus (0—3 cm), humid — 16 ♀♀, 9 ♂♂, 5 deutonymphs; 1 protonymph

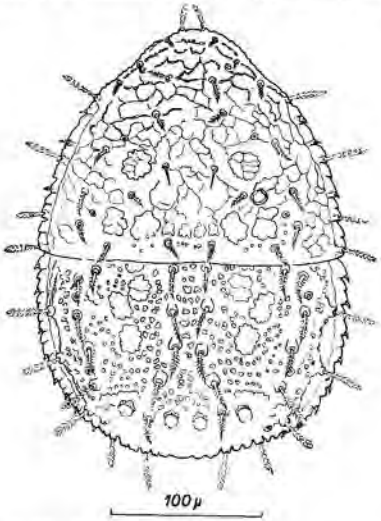


Fig. 13. *Prozercon trägårdhi* (Halbert) deutonymph

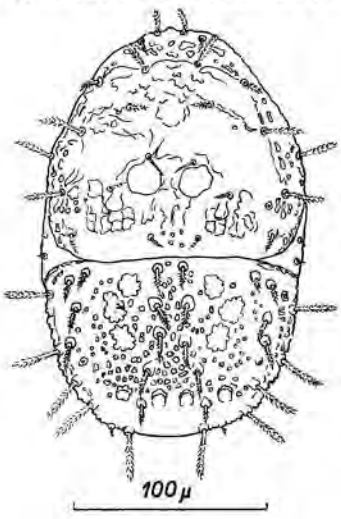


Fig. 14. *Prozercon trägårdhi* (Halbert) protonymph

Bohemian Forest:

Hojsova Stráž — Jezerní stěna (875 m a. s. l.) 1. 9. 1957. Mixed fir forest, undergrowth: *Lycopodium, Oxalis, Dryopteris, Vaccinium.* Litter, humus layer on stony ground, humid — 5 ♀♀, 2 ♂♂, 1 protonymph

Jizera Mountains:

Velká jizerská louka (650 m a. s. l.) 24. 10. 1958 Deciduous forest. Leaf litter. 1 ♀, 1 ♂

Czech-Moravian Highlands:

Polom near V. Střítež (640 m a. s. l.) 2. 7. 1962 Beech-fir forest. Beech-mull, humid — 4 ♀♀, 1 ♂

Žákova hora (800 m a. s. l.) 3. 7. 1962. Beech-fir virgin forest. Undergrowth: *Acer, Senecio, Dryopteris, Mercurialis perennis, Rubus idaeus, Asperula odorata, Urtica dioica, Oxalis.* Leaf litter and raw hummus (2 cm), humus layer (3 cm), dry to humid — 3 ♀♀

Moravia

Rychlebské Mountains:

Ramzová (near Jeseník) (800 m a. s. l.) 12. 9. 1958 *Callunetum* — 2 ♀♀, 1♂

Central Moravia:

Černotín (near Hranice) (280 m a. s. l.) 5. 6. 1959 — 3 ♂♂

South Moravia:

Lednice — Hlohovecký rybník (170 m a. s. l.) 16. 6. 1961. Deciduous wood enclave in meadows *(Catalpa, Crataegus, Populus)*, herb stratum: *Colchicum, Knautia, Galium;* moss layer: *Mnium undulatum.* Tufts of grass, upper soil layer, dry to humid — 1 ♀, 1 ♂

Lednice — park (170 m a. s. l.), 21. 6. 1958. Litter of oak, upper soil layer, dry — 2 ♀♀, 2 ♂♂

Štiavnické Mountains:

Žemberovce (320 m a. s. l.) 12. 6. 1962
Deciduous forest *(Querceto-Carpinetum)*. Litter (1—2 cm), humus layer, high humus content, dry to humid — 4 ♀♀

Krupina Hills:

Plášťovce (300 m a. s. l.) 12. 6. 1962
Deciduous woods *(Quercus cerris)* in undergrowth *Juniperus communis*. Leaf litter (2 cm), humus layer (½ cm), dry — 2 ♀♀

Tribeč Mountains:

Nitra—Zobor (280 m a. s. l.) 13. 6. 1962
Beech and oak forest. Leaf litter (2 cm), raw humus (½ cm), humus layer with mineral horizon (2 cm), humid — 1 ♀

Ecology: Ecology is relatively little known. Franz (1954) records this species from meadows, oak-forests and peat-bogs.

As far as it possible to conclude on the basis of sporadically found specimens, this species puts up with conisederable variations of humidity and humus-content.

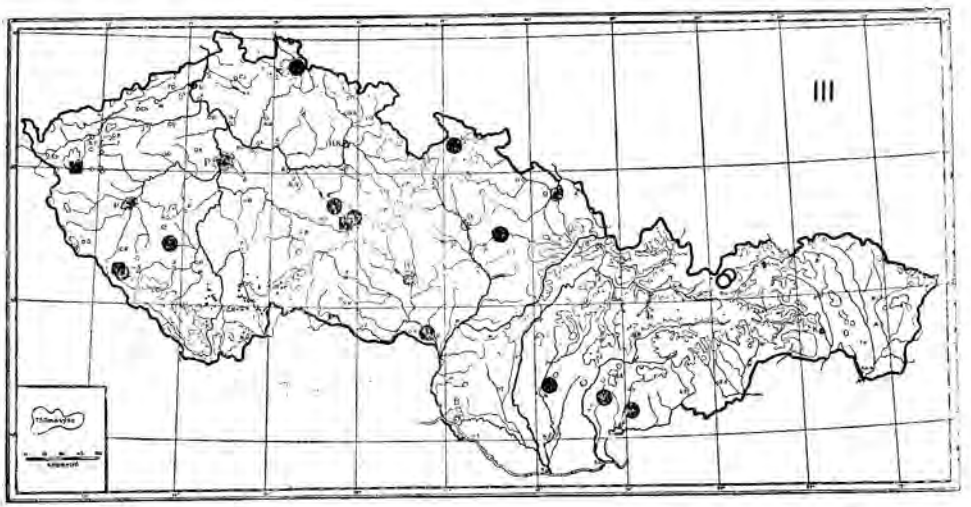
Prozercon kunsti n. sp. (figs. 15, 16)

Female: 350 × 260 μ (Holotype), 371 × 260 μ
Male: 270 × 212 μ (Allotype), 323 × 207 μ

The notocephale is reticulated with a network of lines, ridges and punctuate areas. The polygonal areas are more conspicuous in the anterior part of the shield than in the posterior one. These areas are bordered by strong ledges in the anterior part of the shield. The bordering is less conspicuous in the posterior; the polygonal areas are there smaller, too. Under the hairs i 5 there are strikingly conspisuous oval spots bordered by a chitineous ridge. Further oval areas can hardly be seen between the setae i 5 and s 3.

All the hairs on the surface of the notocephale (except hairs i 5) are well plumose. As to the marginal setae of the notocephale, they are plumose, too. The hairs r 2 and r 3 are shorter when compared with other setae.

The pores po 1 are situated outside the line connecting i 3 with s 1, pores



Map III. Distribution of *Prozercon sellnicki* n. sp. (■), *P. trägårdhi* (Halbert) (●) and *P. kunsti* n. sp. (○) in Czechoslovakia.

po 2 are situated below the line joining the insertions of hairs i 4 with those of hairs s 3. The pores po 3 are situated inwardly between the insertions of hairs s 4 and s 5.

The anterior middle part of the notogaster shows some kind of coarse irregular texture. There are 3—4 depressed areas between the rows of hairs J and Z; their borders are lobe-like. The depressions on the posterior of the body are star-shaped; they are, however, not so well conspicuous as in the other representatives of the genus.

All the hairs of the anterior surface of the notogaster are conspicuously plumose. The distance between J 1—J 2 nearly three times larger than the distance between J 2—J 3. Row Z shows the usual number of hairs (5). Seta S 1 is shifted distinctly toward the centre of the body as to be in the same row with hairs Z. This displacement of seta S 1 is accompanied at the same time, by a shifting of pore Po 2 towards the axis, although it is regularly situated in all other species of the genus outside the line joining the insertion of the hairs of row Z. Seta R 1 is plumose, the remaining marginal setae are short bristles.

Pores Po 1 lie on the line joining the insertions of setae J 1—Z 1, nearer to hairs Z 1, pores Po 2 are situated on the inner side of the line S 1—Z 2, pores Po 3 are outside between Z 3 and Z 4, and lastly, pores Po 4 are on the inner side of the insertion of hair S 4.

Deutonymph (fig. 16)

Measurements: 324 × 228 μ

The texture of the notocephale is not so conspicuous as in the female.

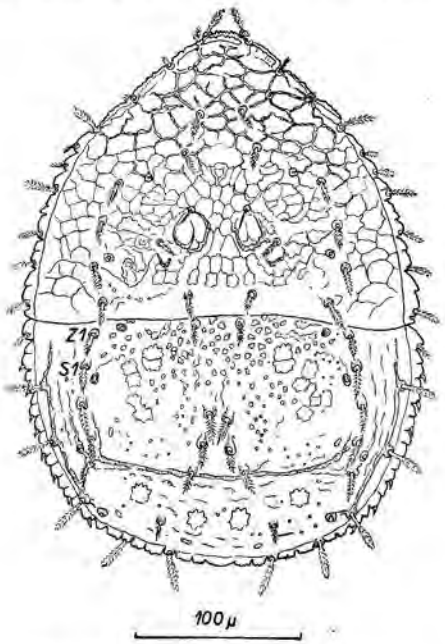


Fig. 15. *Prozercon kunsti* n. sp. ♀

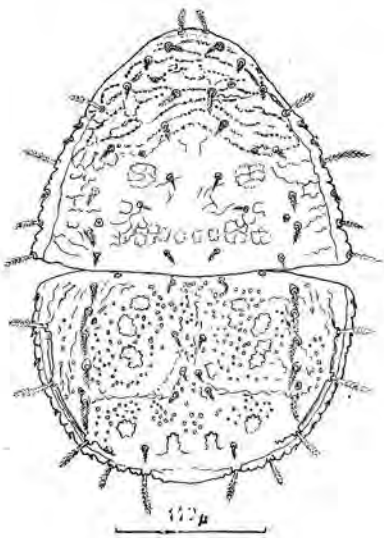


Fig. 16. *Prozercon kunsti* n. sp. deutonymph

The spots under the insertions of hairs i 5 are absent. The hairs are altogether shorter than on the adults. The shortness of seta r 5 is very striking.

The ornamentation of the notogaster reveals but few minor differences, when compared with the adult stage. The same can be stated about the shape, length and position of the hairs of rows Z and S. The development of the hairs in row J has not yet advandced. These hairs are conspicuously shorter, less plumose. Their position is especially striking. Whereas hairs J 2—J 2' on the adult animals are close to one another (which may be taken for a characteristic feature) and are situated near the pore of the following seta, the corresponding hairs of the deutonymph are situated nearly at half the distance J 1—J 3.

Hair R 1 is conspicuously plumose, but it is much shorter than the corresponding seta of the adult.

Remarks: *P. kunsti* n. sp. belongs to the group of species the dorsal side of which is provided with hairs that are all (except i 5) plumose. The species *P. trägårdhi* and *P. sellnicki* n. sp. belong to the same group.

The chief distinguishing character of the new species (when compared with the species *P. trägårdhi* and *P. sellnicki* n. sp.) are the unusually short hairs r 2 and r 3. A further distinguishing character is the striking shifting of the insertions of some hairs on the notogaster. This applies especially to hairs J 2 that are situated strikingly near the insertions of hairs J 3 and the medial line. The fixation of this distinguishing character takes place but in the last phase of the development. This pair of hairs does not show any difference in the deutonymph; these hairs are situated nearly at one half of the distance J 1—J 3.

As stated in the description, there is a further change in row S, the first member of which is shifted into row Z, while pore Po 3 is pushed axially.

A further difference of the new species consists in the featheriness of the first hair of row R on the notogaster.

All these character give the new species an exceptional position, which is stressed moreover by their occurence in the High Tatra only.

Localities:

Slovakia

High Tatra:
Štrbské Pleso — Vyšné Hágy (1170 m a. s. l.) 11. 7. 1958
A decaying tree — 1 ♀
Velká Studenovodská dolina (1500 m a. s. l.) 10. 11. 1960
Meadows, tussocs of *Calamagrostis*, soil on roots, 0—5 cm, humid — 1 ♀, 1 ♂
Skalnaté pleso — Lomnice (1600 m a. s. l.) 12. 11. 1960
Pinus mugho thicket, moss layer: *Polytrichum, Sphagnum,* moss and raw humus wet — 1 ♀, 1 deutonymph
Skalnaté pleso — Lomnice (1200 m a. s. l.) 12. 11. 1960
Fir forest, litter 0,5 cm, raw humus 3 cm, humid — 1 ♂

Type locality: Velká Studenovodská dolina

Distribution: Czechoslovakia

Ecology: In the mountaine zone of the Tatra only, reaching above the tree line. With regard to the scarcity of specimens hinterto found it is impossible to judge exactly their ecological preference. This species was found in humid or moist habitats with a considerable humus content.

Concluding remarks

There are seven species of the genus *Prozercon* that have been known from Czechoslovakia till now. This is a relatively great number considering the fact

:hat the recently published paper by S e l l n i c k (1958) records but three spe-
:ies from Europe, excluding Berlese's South-European species, which have not
:een described satisfactorily and have not been found again, further the spe-
:ies *Prozercon willmanni* S c h w e i z e r 1948 from Switzerland that was de-
:ermined by S e l l n i c k as a variety of *Prozercon kochi* and the species *Pro-
:ercon aristatus* A t h i a s - H e n r i o t 1961 from Spain. The representatives of
:his genus occur, however, often sporadically on ecologically different or
:eographically isolated habitats, so that there is a great possibility of speci-
:tion.

The European species of the genus form two groups that differ in the development of the chaetotaxy.

The species *P. kochi, P. carsticus* n. sp., *P. fimbriatus* and *P. lutulentus* belong to the first group. They are characterized by the smoothness of the setae on the surface of the notocephale (except the finely pilose hairs z 2, s 2 of the species *P. fimbriatus* and the plumose hairs i 2 of the species *P. lutulentus* n. sp., further by the setae of the notocephale as well as of the notogaster, which undergo a regressive development from the deutonymphal stage to the adult one. (I do not give the situation in the species *P. lutulentus* n. sp. the deutonymph of which has so far not been found.) First of all, this relates to seta i 3. It is long, plumose on deutonymphs of this group, but it is short and smooth on the adult specimens. As for the species *P. kochi,* the setae S 2, S 3 suffer this regression. The same phenomenon may be seen on seta S 2 of the species *P. carsticus* n. sp. and on the seta S 1 of the species *P. fimbriatus.*

On the contrary, a number of smooth setae of the deutonymphal stage grow feathered when developing into the adult stage. This relates to hairs J 3, J 4, J 5 and r 5 of the species *P. kochi,* to setae J 1, J 5, Z 1, Z 2 and r 5 of the species *P. carsticus* n. sp. to hairs s 5, z 2 and r 5 of the species *P. fimbriatus.*

The species *P. trägårdhi, P. sellnicki* n. sp. and *P. kunsti* n. sp. belong to the second group. Their chief distinguishing character, by which they can be easily separated from the species belonging to the first group is:

a) marked feathering of all setae on the dorsal side, except hairs i 5;
b) the presence of a pair of spots under hairs i 5, which are bordered by thick edges;
c) that the change in setation from the deutonymphal stage to the adult form is not, always accompanied by a loss of feathering on some hairs, such as is the case in the preceding group.

Supposing the development of the species belonging to the genus *Prozercon* having passed from the species with smooth setae to the species the feathered hairs of which grow more frequently (which supposition seems to be proved by the final phase of development of all species because the regression of feathering that was spoken of with regard to the first group, is far less often than the opposite phenomenon), one obtains this order of development: *P. kochi, P. carsticus* n. sp., *P. fimbriatus* and *P. lutulentus* n. sp. (as to the first group) and *P. sellnicki* n. sp., *P. trägårdhi* and *P. kunsti* n. sp. (as to the second group).

The following table gives a survey of the shape of some taxonomically more important setae on the antero-dorsal shield, as well as on the notogaster of the various species:

	r2	i2	z2	s5	J1	J2	Z1	Z2	S1	S2	S3	R1
P. kochi	—	—	—	—	—	—	—	—	—	—	—	—
P. carsticus n. sp.	—	—	—	—	|	|	|	|	—	—	+	—
P. fimbriatus	—	—	|	|	+	+	+	+	—	+	+	—
P. lutulentus n. sp.	+	+	—	—	+	+	+	+	—	+	+	+
P. sellnicki n. sp. *P. trägårdhi*	+	+	+	+	+	+	+	+	+	+	+	—
P. kunsti n. sp.	+	+	+	+	+	+	+	+	+	+	+	+

— = simple hairs, | = pilose hairs, + = plumose hairs

Considering data given in this table, the species *P. selnicki* n. sp. and *P. trägårdhi* have the same degree of setation. *P. sellnicki* n. sp. however, is placed at the beginning of the second group; its deutonymphs have some smooth setae (z 2, i 6) on the notocephale, whereas the deutonymphs of both feather species agree — as to the feathering of setae — with the adults. The last member of this group also shows a feathering of the marginal hair R 1 and, further, of setae po 1 on the ventral side of the body.

The species *P. kochi* is the most widely distributed of all species belonging to the genus *Prozercon*. It was found nearly on the whole territory of Czechoslovakia, more abundantly, however, in some humid localities.

The species *P. fimbriatus* is a further species known from a greater number of localities. According to finds, this species has a greater ecological valency than *P. kochi*. It also occurs in drier habitats, which are avoided by *P. kochi*.

P. lutulentus n. sp. is known only from the xerothermous Bohemian Central Mountains.

P. trägårdhi has been known from eleven localities. The specimens of *P. sellnicki* n. sp. are only from the western part of the Ore Mountains, from the Bohemian Forest and from the Czech-Moravian Highlands.

P. kunsti n. sp. was found only at higher altitudes of the Tatra Mountains, whereas *P. carsticus* n. sp. has been known from the xerothermous region of the South-Slovakian Karst.

Acknowledgements

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