A REVISION OF THE FAMILY ZERCONIDAE (ACARI, MESOSTIGMATA) (SYSTEMATIC STUDIES ON FAMILY ZERCONIDAE — I)

BY

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Until now the family Zerconidae (comprised five genera, namely : *Zercon* C. L. Koch, 1836 ; *Parazercon* Trägårdh, 1931 ; *Prozercon* Sellnick, 1943 ; *Mixozercon* Halašková, 1963 ; *Amerozercon* Halašková, 1969a. Beginning with the first summary work of SELLNICK (1958b) the main systematic feature of the genera above all was the surroundings of the peritremal shield. EVANS (1957) likewise, took into consideration the shape of the peritremal shield and the shape and number of setae on this shield. However, in addition, he considered the vertical part of the podonotum. SELLNICK's (1958b) basic feature of the genera was the number of setae on the peritremal shield. Similarly HALAŠKOVÁ (1963b) distinguishing the genus *Mixozercon*, supported above all the number and shape of the setae on the peritremal shield. This same author in 1969 described the new genus *Amerozercon*, in addition to the shape of the peritremal shield and the shape and number of setae on the shield, the features he used was the presence or absence of the adgenital shields. Later in a monograph work of the family Zerconidae from Czechoslvakia (HALAŠKOVÁ, 1969b) apart from mentioning this feature the author additionally considered the number of setae on the margin of the opistonotum. These same genera features, the so called adgenital shields, number of setae on peritremal shield, anterior margin of ventro-anal shield and margin of opisthonotum are still mentioned as genera features by BŁASZAK (1974).

On the basis of data from literature and (of examination of material from East Asia the genera features of the adult stage can be recognized as follows : 1) Shape of the peritremal shield. 2) Number and shape of setae on the peritremal shield. 3) Presence or absence of adgenital shields. 4) The connection or separation of the peritremal and ventro-anal shields. 5) Length of the peritreme. From these features I developed a key to the genera which appears below. Auxiliary features are number of setae on : the margin of the opistonotum, anterior margin of ventro-anal shield, podonotum and opisthonotum.

Taking into consideration the above features, to credit some of the already described species into the present genera is impossible. Regarding among other two species described by SELNICK (1958a) from North America and included by the author into genus *Prozercon* Sellnick namely : *Prozercon californicus* Sellnick and *Prozercon praecipuus* Sellnick.

In *Prozercon californicus* Sellnick the lateral side of the peritremal shield (fig. 1) is connected at the ventro-anal shield whereas in the genus *Prozercon* Sellnick the peritremal shield (Fig. 15) is free and is extended posteriorly, especially its lateral external end which reaches up to seta R5. The connection of the peritremal shield with the ventro-anal shield appears only in the genus

Amerozercon Halašková (Fig. 17), in which the peritremal shield is cut in a transverse direction behind the fourth pair of coxae and is connected with the ventro-anal shield only on the sides. However in *Prozercon californicus* Sellnick the peritremal shield extends posteriorly behind the fourth pair of coxae, especially the lateral external end which is connected on the lateral side with the ventro-anal shield. In the genus *Amerozercon* Halašková, the peritremal seta p2 is long and plumose (Fig. 17), whereas in *Prozercon californicus* both peritremal setae are short and smooth. In Sellnick's description, data is absent regarding the existence of the adgenital shields. After considering these differences it is my opinion that the species *Prozercon californicus* Sellnick belongs to the established new genus which I have named :

Microzercon gen. nov.

Typus generis : *Prozercon californicus* Sellnick, 1958.

The second species which can not by included to the genus *Prozercon* Sellnick is *Prozercon praecipuus* Sellnick, 1958. Its peritremal shield (Fig. 2) is terminated truncately posteriorly behind the fourth pair of coxae as in the genus *Zercon* C. L. Koch (Fig. 13). However, in the genus *Prozercon* Sellnick, the peritremal shields (Fig. 15) extend posteriorly, especially the lateral external ends which reach up to seta R4. In *Prozercon praecipuus* Sellnick the peritremal shield reaches to the margin of the podonotum while in genus *Zercon* C. L. Koch (Fig. 13) between the peritremal shield and the margin of podonotum is a fairly wide unsclerotized slit. On the peritremal shield in *Prozercon californicus* Sellnick there are two setae p1 and p2 both short and smooth (Fig. 2), similar their homologues in the genus *Prozercon* Sellnick and different from them in the genus *Zercon* C. L. Koch where seta p1 is short and smooth and p2 is long pilose or plumose. A characteristic feature of *Prozercon praecipuus* Sellnick is the deep incision in the lateral part of the ventro-anal shield reaching to seta R6 (Fig. 2). These differences support the establishment of a new genus which is named :

Macrozercon gen. nov.

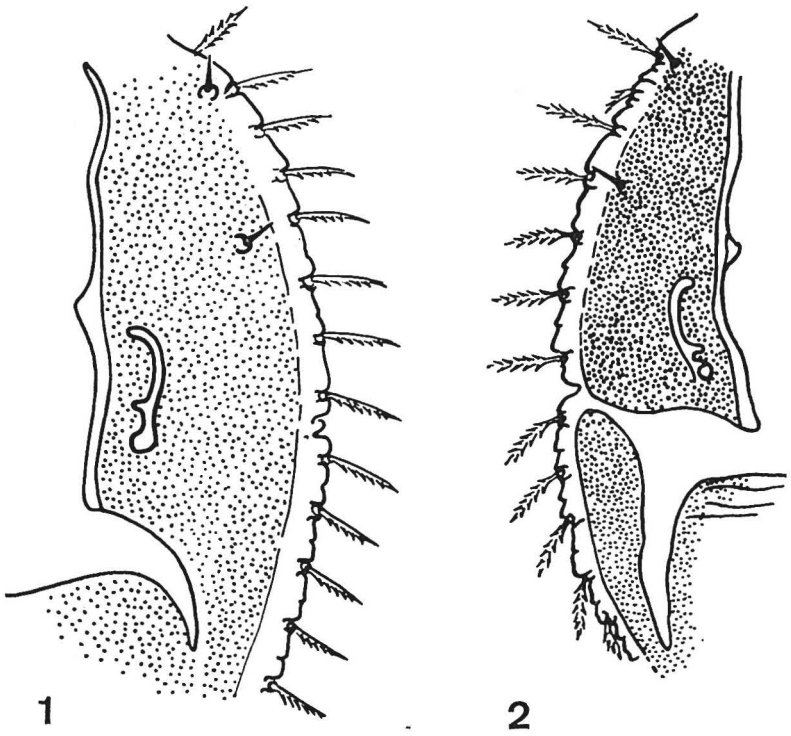
Typus generis : *Prozercon praecipuus* Sellnick, 1958.

In material from North Korea, considering the above mentioned generic features, I establish three new genera which I have named : *Mesozercon* gen. nov., *Echinozercon* gen. nov. and *Metarercon* gen. nov.

Mesozercon gen. nov.

The peritremal shields (Fig. 6) extend posteriorly, especially the lateral external ends which reach up and over the setae R3 and are similar to these shields in the genera *Prozercon* Sellnick and *Parazercon* Trägårdh. On the peritremal shield are two setae p1 and p2, both short and smooth. They are similar to p1 and p2 in *Prozercon* Sellnick but differ from their homologues

in *Parazercon* Trägårdh in which there are three setae (Fig. 14). The feature distinguishing *Mesozercon* from *Prozercon* Sellnick is the presence of the glands gv2 (Fig. 6) which are absent in *Prozercon* Sellnick, in *Zercon* C. L. Koch and *Parazercon* Trägårdh there are the adgenital shields. In the genus *Zercon* C. L. Koch the peritremal shield (Fig. 13) terminates truncately posteriorly behind the fourth pair of coxae and seta p2 is long and plumose.



FIGS. 1-2 : 1) *Microzercon californicus* (Sellnick, 1958) — The peritremal shield (after Sellnick) ; 2) *Macrozercon praecipuus* (Sellnick, 1958) — The peritremal shield (after Sellnick).

Mesozercon coreanus gen. nov., sp. nov.

Female : length 368 μm, width 224 μm.
Dorsal side. (Fig. 3).

Setae : On podonotum in row i, seta i1 (24 μm) is shorter than i2 (34 μm) and is one-sidedly plumose while seta i2 lies over seta i1 and is bilaterally plumose. Setae i3-i6 are delicately bilaterally plumose, their length is 19 μm with i6 reaching a little over the posterior margin of the podonotum. In row z, seta z1 is similar in shape and length to seta i3-i6. Seta z2 is shorter and reaches over the posterior margin of the podonotum. In row s, setae s1 to s3 are one-sidedly plumose lying on the margin of the podonotum, s4-s6 are similar in shape and length to i3-i6. Among the marginal setae of the podonotum, only seta r1 is bilaterally plumose (Fig. 4). The remaining setae r2-r6 are one-sidedly plumose (Fig. 4). On the opistonotum in row I, setae I1-I4 are similar in length and are delicately, bilaterally, plumose. The end of each setae lies beyond

the insertion of the next seta. Seta I5 is longer than the four previous ones, is bilaterally plumose and reaches to the inner dorsal cavities. Seta 16 is one-sidedly plumose and lies 37 μm away from its symmetrical seta. Setae of the Z row are characteristically arranged. Z1-Z3 lie very close to each other and the distance from Z3 to Z4 is twice the distance from Z1 to Z2. Seta Z4 lies on the line connecting the pair of setae I3. Seta S1-S4 are delicately bilaterally plumose and are similar in length to seta Z2. Z5 is bilaterally plumose, lies next to seta 16, and is the longest seta of the opisthonotum. Among the marginal setae of the opisthonotum setae R1-R5 and R7 are one-sidedly plumose about 28 μm. Seta R6 is bilaterally plumose — 32 μm. Length of the setae of the opisthonotum and distance between the setae of the particular rows in μm as in the following table :

S1-14	Z1-14	I1-25
35	9	16
S2-16	Z2-14	I2-25
38	9	18
S3-16	Z3-14	I3-25
25	18	18
S4-16	Z4-14	I4-25
	96	18
	Z5-35	I5-25
		44
		I6-35

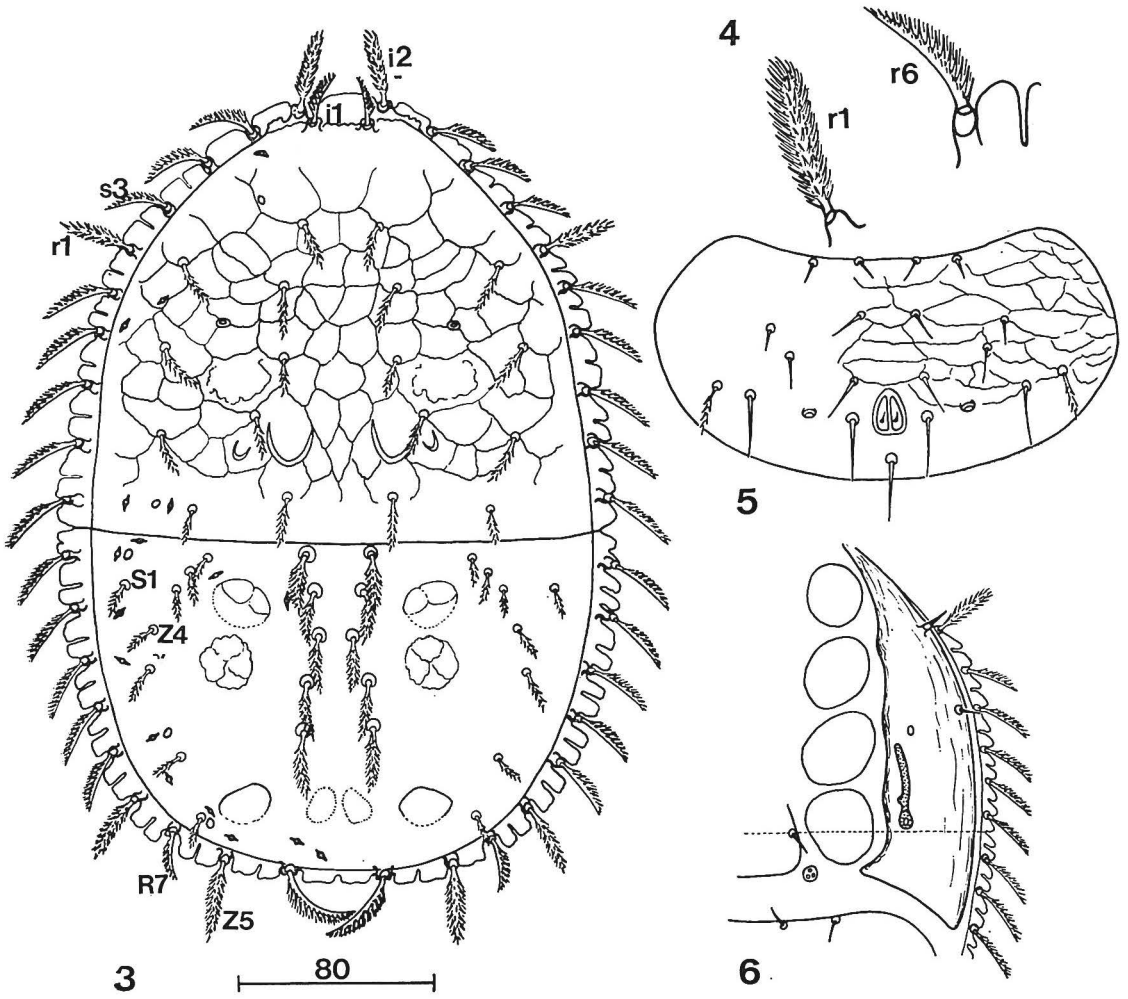
Pores : On the podonotum, pore po1 lies on the line connecting setae S2-13, closer to seta s2. Pore po2 lies on the middle line connecting s5-i4. Pore po3 is on the line connecting setae r6-s6. On the opisthonotum, pore Po1 lies between the anterior margin of the shield and the insertion of S1. Pore Po2 is absent. Pore Po3 lies between S2 and S3. Pore Po4 lies close to seta S4.

Sculpture : The podonotum has a tile-like sculpture, covering as far as seta s6. Between setae z1 are two crescent shaped chitineous outgrowths. The posterior part of the podonotum is smooth. The entire opisthonotum is smooth, however, in the anterior part between setae Z1 and I rows are two bright fields. The dorsal cavities are only weakly discernable.

Ventral side.

The peritremal shields (Fig. 6) extend posteriorly, especially the lateral external ends which reach up and over seta R3. On the peritremal shiedl are two setae, p1 and p2, both short and smooth. The peritreme is short and reaches to the third coxa. The adgenital shields are absent there are only opening of the glands gv2 (Fig. 6). On the ventro-anal shield are 9 pairs of setae (Fig. 5). On the anterior margin of the ventro-anal shield are 4 setae. On this shield the adanal setae, Vl1 and Vl2 are twice as long as the remaining setae and they are similar in length to the postanal seta. The characteristic feature of the setae on the ventro-anal shield is the distinctly pilose seta Vl1. The pore (gv3) on the ventro-anal shield lies on the line connecting setae Ad and Vl2. The opistho- notum has a hyaline finger — like border trim.

The new species has some features similar to *Prozercon plumatus* Aoki. The position of setae lying on the dorsal side is similar to setal position of this species. In addition, both species have two short and smooth setae appearing on the peritremal shield. However, the shape of the peritremal shield in the description of *Prozercon plumatus* Aoki is indiscernable. Furthermore,



FIGS. 3-6 : **Mesozercon coreanus** sp. nov. ; 3) Dorsum of female ; 4) The marginal setae of the podonotum ; 5) The ventro-anal shield ; 6) The peritremal shield.

there is no evidence as to whether adgenital shields are present or absent in Aoki species. From the similarity of the setae arrangement od the podonotum and opisthonotum, it is suggested that *Prozercon plumatus* Aoki, after further research on the ventral side may by excluded from the genus *Prozercon* Sellnick.

Mesozercon coreanus sp. nov. differs mainly from *Prozercon plumatus* Aoki, by the shape of the setae. In the new species the setae are bilateral by or one-sidedly plumose and there are delicate dorsal cavities, whereas in *Prozercon plumatus* Aoki the dorsal cavities are absent. In *Prozercon plumatus* Aoki, setae Z1 and Z2 are equally removed from the anterior margin of the opisthonotum. However, in *Mesozercon coreanus* sp. nov. seta Z2 lies twice as far from the anterior margin of the opisthonotum as seta Z1. In *Prozercon plumatus* Aoki, the marginal row of setae on the opisthonotum has eight setae and setae Z5 are absent. The position and shape of seta R8 suggests that it is actually seta Z5 so that in the row of marginal setae there would be 7 setae, as in the new species. In addition, the number of setae on the opisthonotum in *Prozercon plu-*

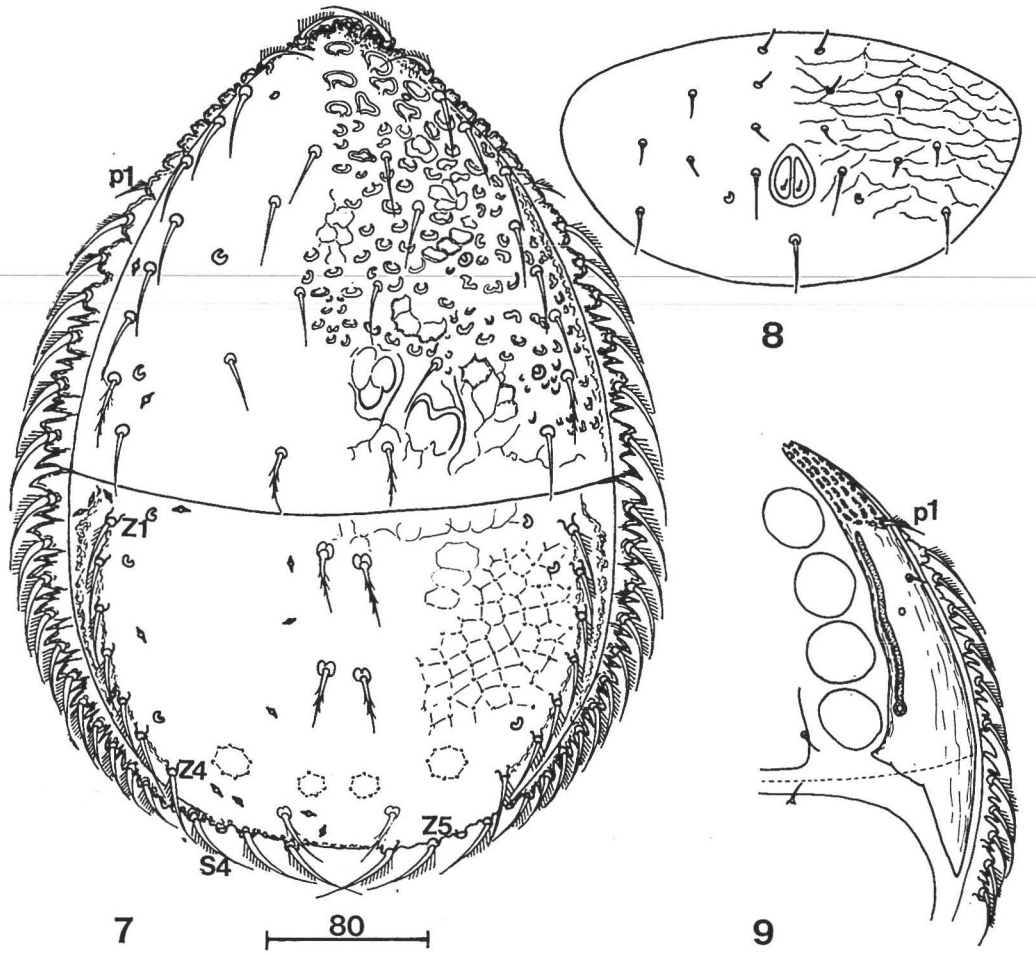
matus Aoki is smaller by 2, the total number of setae being 44, whereas in the genus *Prozercon* Sellnick the number of opisthonotal setae is 46. In my opinion, the systematic position of *Prozercon plumatus* Aoki is not clear and needs revision.

Localities. North Korea. 18 06 74 — Kymgang San. Southern slop Manmur — sang 550 a.s.l., mixed forest on waterside of the stream, litter. Leg. A. Szeptycki. Holotype ♀.

Specimen in author's collection.

Echinozercon gen. nov.

In this genus, the peritremal shield (Fig. 9) extends posteriorly, especially the lateral external end which is the some as in the genera *Prozercon* Sellnick and *Parazercon* Trägårdh. On the peritremal shield are two setae, p1 long and plumose this is the only occurence in the family Zerconidae and p2 short and smooth (Fig. 9). In the genus Parazercon Trägårdh there are 3 setae on the peritremal shield. However in the genus *Prozercon* Sellnick, there are two setae



FIGS. 7-9 : **Echinozercon orientalis** sp. nov. 7) Dorsum of fremale ; 8) The ventro-anal shield ; 9) The peritremal shield.

which are short and smooth. In the new genus, the adgenital shields are absent, as in the genus *Prozercon* Sellnick. However, in the genus *Parazercon* Trägårdh the adgenital shields are present. The specific feature in *Echinozercon* is a very long peritreme in the adult stages ; this peritreme reaches over the insertion of setae p2. The frontal part of the peritremal shields exhibits a characteristic sculpture.

Echinozercon orientalis gen. nov., sp. nov.

Female : length 440 μm, width 310 μm.
Dorsal side. (Fig. 7).

Setae : On the podonotum in row i, setae i1 and i2 are one-sidedly plumose and their length is 44 μm and 30 μm, respectively. Setae i3 to i5 are long (30 μm) ; setae i6 is long and delicately pilose, measuring around 30 μm. Seta z1 is smooth (30 μm long), z2 is also smooth (35 μm) but appears in the margin of the podonotum. In row s, setae s1 — s6 are long (32 μm) and smooth, s7 (35 μm) is delicately bilaterally pilose. In the marginal row of the podonotum, setae r1 — r6 are long (40-44 μm) and one-sidedly plumose. On the opisthonotum in row I the setae I2 and I4 are absent. I1 is delicately bilaterally pilose and reaches as far as half the distance to I3. Setae I3 and I5 are similar to I1. Setae I5 extend by almost half of their length over the posterior margin of the opisthonotum. Setae I6 are one-sidedly plumose, lying 50 μm away from one another. Setae of row Z and S lie in one row, they are one-sidedly plumose and lie alternately from Z1 to Z5. In the marginal setae of the opisthonotum the one-sidedly plumose setae are characteristically curved. Length of the setae of the notogaster and distance between setae of particular rows in μm, as in the following table :

S1-35	Z1-35	I1-35
44	44	
S2-35	Z2-35	60
44	44	
S3-35	Z3-35	I3-32
46	44	
S4-35	Z4-35	74
	44	
	Z5-44	I5-30
		I6
		I6-48

Pores : On the podonotum, pore po1 lies on the line connecting setae s1 and is distant from s1 by three times its diameter. Pore po2 is twice as large as po1 and lies on the line connecting setae s4 and i5, but closer to s4. Pore po3 lies on the line connecting setae s7 and z1 and is distant from s7 by once its diameter. On the opisthonotum, pore Po1 lies between row Z and I and is distant from Z1 by twice its diameter. Pore Po2 lies on the line connecting S1 and I1 and is distant from S1 by its diameter. Pore Po3 lies distant from S3 by once diameter in the direction of I1. Pore Po4 lies in the middle of the line connecting S4 and Z5.

Sculpture : The covering of the podonotum to the insertions of setae s6 has a distinctly oval-shaped or mushroom-shaped protuberances. The largest protuberance lies on the anterior part

of the podonotum. In the region of setae z1 lies a bright field with a characteristic shape. The back part of the podonotum is delicately cover ed by lines . The middle part of the opistonotum is smooth. In the side regions, the shield is covered by a delicate tilé like design which extends to Po3. The dorsal cavities are very delicate, in structure they are similar to the dorsal cavities in the genus *Parazercon* Trägårdh.

Ventral side. On the ventro-anal shield are 8 pairs of setae. (Fig. 8). On the anterior margin, this shield has two setae Vi1 is absent). Adanal setae and setae Vl2 are over twice the length of the remaining setae of the ventro-anal shield. The ventro-anal pore (gv3) lies posteriorly beyond the insertion of the adanal setae. Adgenital shields are absent. The peritremal shields extends posteriorly behind the fourth pair of coxae. This shield bears two setae : seta p1 is long (22 μm) and is one-sidedly feathered, as are the marginal setae of the podonotum. Seta p2 is short and smooth. The peritreme in the adult stage is very long, a characteristic feature present only in this genus. The peritreme almost reaches to the insertion of setae p1. The accesoory peritremal pore (gd3) lies half way up the peritreme. The frontal parts of the peritremal shields have the characteristic sculpture. The margins of podonotum and opisthonotum are characteristically serrated.

Localities. North Korea. 23 05 74 — Hamjong Punkto. The slope Kvanmo — bong from side Onpho — ri. Canyon of stream Džyur — čhon, near waterfall, oak wood with great participation *Kalopanax pictum*, 1300 a.s.l., litter and rotting wood. Leg. A. Szeptycki. Holotype ♀.

Specimen in author's collection.

Metazercon gen. nov.

In this genus, the peritremal shields (Fig. 11) terminate truncately, posteriorly behing the fourth pair of coxae as in the genera *Mixozercon* Halašková and *Zercon* C. L. Koch. On the peritremal shield are two setae p1 (20 μm) smooth, p2 twice as long as seta p1 and delicately pilose. The peritreme reaches only to the posterior margin of the third pair of coxae. The postero-lateral part of the peritremal shield has a characteristic incision (Fig. 11). The genera *Zercon* C. L. Koch and *Mixozercon* Halašková lack this incision. In the new genus, between the peritremal shield and the margin of the podonotum is a fairly wide weakly sclerotiz slit similar to that found in the genus *Zercon* C. L. Koch. However, in *Mixozercon* Halašková, the peritremal shield reaches to the margin of the podonotum. In *Metazercon* gen. nov., the adgenital shields are present with two pores (the gland opening of gv2) as in the genus *Zercon* C. L. Koch. In the genus *Mixozercon* Halašková the adgenital shields are absent (there is only a single opening of gland gv2 (Fig. 16). In the new genus between the genital shield and the ventro-anal shield, lie two narrow sclerites without setae. In the genera *Zercon* C. L. Koch and *Mixozercon* Halašková, the sclerites between the genital shield and ventro-anal shield are always absent. In the genus *Metazercon* gen. nov. only two large dorsal cavities are found whereas in the genera *Zercon* C. L. Koch and *Mixozercon* Halašková there are four dorsal cavities. In the new genus, there are 8 marginal setae, whereas in the genera *Zercon* C. L. Koch and *Mixozercon* Halašková there are 7 marginal setae.

Metazercon athiasae * gen. nov., sp. nov.

Female : length 320 μm, width 220 μm.
Dorsal side (Fig. 10).

Setae : On the podonotum row i comprises 6 smooth setae (their length ranging from 18 to 24 μm). In row z, there are two smooth setae equally long. In row s there are 6 setae (seta s6 is the longest and measures 45 μm). In row r, there are 6 smooth setae (their length ranging from 14 to 25 μm.) On the opisthonotum all setae are smooth. In row I, seta I1 reaches to the base of seta I2. Seta I2 extends by almost half of its length over the base of seta 13. Seta 13 reaches the base of seta 14. Setae 15 are very short and lie 96 μm distant from one another. Setae 16 together with seta 12 are the longest setae in row I. Setae 16 lie 48 μm distant from one another. In row Z, seta Z1 reaches over the base of seta Z2. Likewise, seta Z2 reaches over the base of seta Z3, and Z3 over the base of seta Z4. Seta Z4 is the longest in this row. The distance between seta Z5 and 16 is 17 μm. In row S, all the setae are the same length, with the exception of S1 wich is shorter. The setae S2 — S4 are the longest setae of the opisthonotum. The distances between the setae in row S are equal. There are 8 marginal setae on the opisthonotum. Their length is about 27 μm.

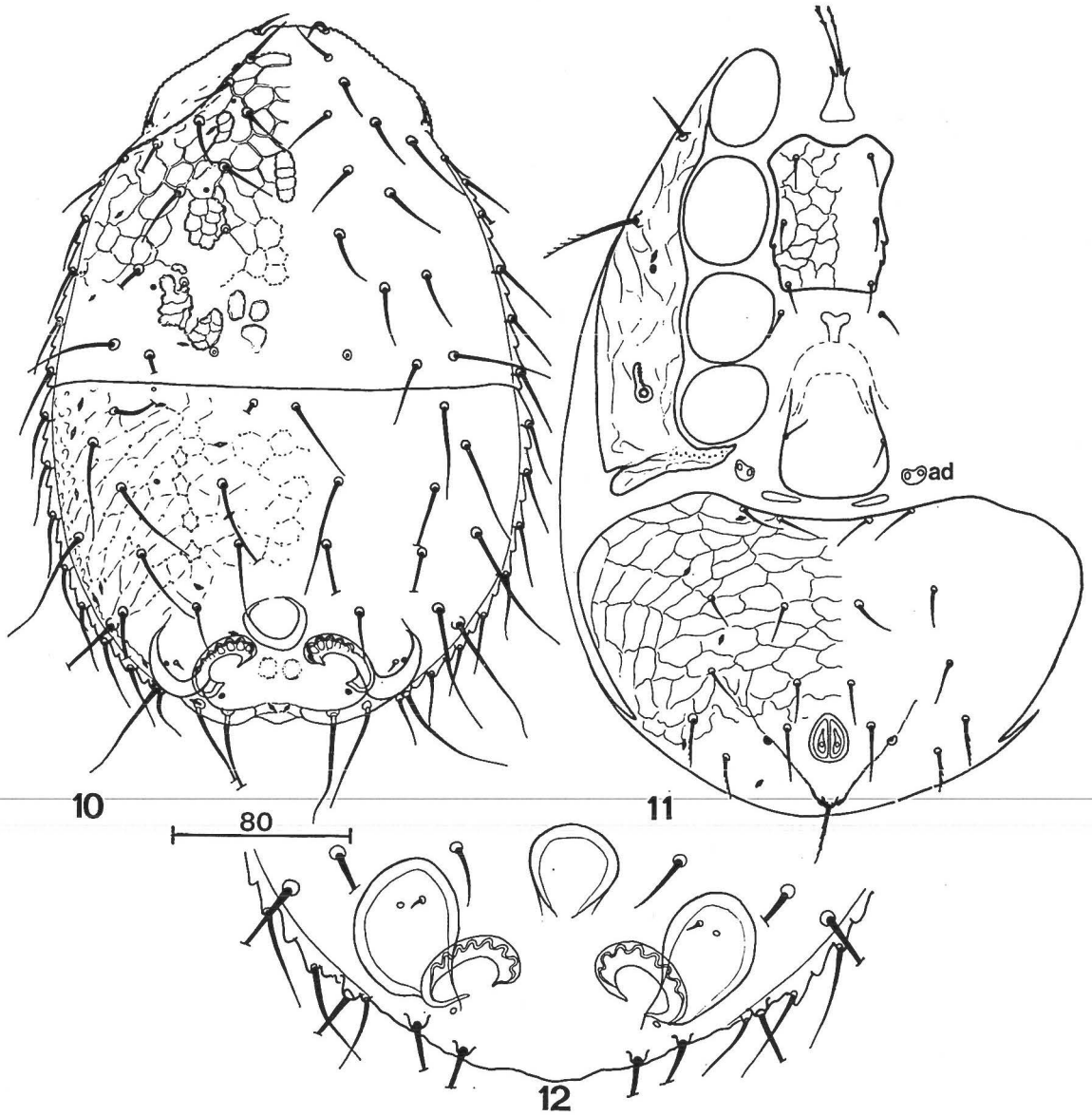
Length of the setae of the notogaster and distance between setae of particular rows in μm as in the following table :

S1-50	Z1-44	I1-40
42	36	38
S2-62	Z2-44	I2-55
42	32	30
S3-62	Z3-38	I3-34
42	28	32
S4-62	Z4-56	I4-22
	56	28
	Z5-52	I5-6
		38
		I6-56

Pores : On the podonotum, pore po1 lies under the line connecting setae s1 and i3. Pore po2 lies under the line connecting setae i4 and s4. Pore po3 is situated under the line connecting setae z1 and s5. On the podonotum lie five pairs of the lyriform organs. On the opisthonotum, pore Po1 lies medially to setae Z1 behing the edge of the podonotum. Pore Po2 lies above the line connecting setae Z2 and I2 and closer to Z2. Pore Po3 lies on the line connecting setae I5 and the lateral margin of the opisthonotum and is distant from I5 by once its diameter. Pore Po4 is situated behind the lateral corner of the dorsal cavities and is distant from them by once its diameter. The opisthonotum bears 13 pairs of lyriform organs.

Sculpture : The front section of the podonotum has a distincly tile-like design to the level of seta s4. In the middle section (between setae i5 and z1) a delicate tile with bright points constituing the corners is visible. Between setae s4 and i5 are bright fields. Similar fields are

* The species is named in honour of dr. C. Athias-Henriot (Dijon).



FIGS. 10-12 : **Metazercon athiasae** sp. nov. : 10) Dorsum of female ; 11) Venter of female ; 12) The posterior part of the opisthonotum in prepared slide.

located on the posterior part of the podonotum in the region of setae z1 and i6. Under setae z1 lie crescent shaped cuticular outgrowths. The middle part of the opisthonotum has a delicate tile-like design extending to the base of seta I3. The lateral parts of this shield is covered by the distinctly tile-like sculpture to seta Z4. Between setae rows Z and I, are distinct bright fields of a characteristic shape. In the posterior part of the opisthonotum there are two large dorsal cavities (this is the only occurence of such cavities in the family Zerconidae). The width of the dorsal cavities is 35 μm. The distance between dorsal cavities is 22 μm. The dorsal cavities are arranged diagonally in respect to the body axis. In the region of the dorsal cavities there are three well sclerotized hillocks. The smallest and unpaired one, lies between the dorsal cavities.

The others are paired and, larger, and lie behind the posterior corners of the dorsal cavities. The above described position of the hillocks is their natural position. On a prepared slide the hillocks may have been moved forward (Fig. 12).

Ventral side (Fig. 11).

The peritremal shield (Fig. 11) terminates truncately posteriorly behind the fourth pair of coxae. The peritremal shield bears two setae, p1 (20 μm) which is smooth, and p2 which is twice as long as p1 and delicately pilose. The peritreme is very short. A characteristic feature is an incision in the posterior lateral part of the peritremal shield. The adgenital shields are present and contain pores. Between the genital shield and the ventro-anal shield lie two narrow sclerites lacking setae. On the anterior margin of the ventro-anal shield, there are four setae. On the ventro-anal shield, there are 9 pairs of setae (Fig. 11). Setae Vl1 and Vl2 as well as the setae are delicately pilose. Pore gv3 lies posteriorly beyond the insertion of the adanal setae.

Localities. North Korea. 7 08 70 — Province Kengi. Bagyonsan, Bagyon-popo. About 27 km SW from Keasong, near waterfall, litter and moist black humus from diverse sites. Leg. S. Mahunka. Holotype ♀.

Specimen in dr. S. Mahunka's collection (Hungarian National Museum.)

Generic composition of the family Zerconidae.

Taking into consideration the five newly established genera, there are now ten genera in the family Zerconidae, namely : *Zercon* C. L. Koch, *Parazercon* Trägårdh, *Prozercon* Sellnick, *Mixozercon* Halašková, *Amerozercon* Halašková, *Microzercon* gen. nov., *Macrozercon* gen. nov., *Mesozercon* gen. nov., *Echinozercon* gen. nov., *Metazercon* gen. nov.

Diagnose of the genera of the family Zerconidae.

Zercon C. L. Koch, 1836.

Typus generis : *Zercon triangularis* C. L. Koch, 1836.

The peritremal shield terminates truncately posteriorly behind the fourth pair of coxae (Fig. 13). On the peritremal shield, there are two setae, the first one short and smooth — p1 and the second one long and pilose or feathered — p2. Between the peritremal shield and the margin of the podonotum, is a fairly wide weakly sclerotized slit. The adgenital shields are present with 2-4 pores. On the margin of the opisthonotum, there are 7 setae. On the anterior margin of the ventro-anal shield, there are two or four setae.

Parazercon Trägårdh, 1931.

Typus generis : *Parazercon sarekensis* Willmann, 1939.

The peritremal shields extends posteriorly, especially the lateral external ends which extend to seta R4 (Fig. 14). On the peritremal shield there are three setae, p1 and p3 short and smooth, and p2, long and plumose. The adgenital shields are present with 2-4 pores. On the margin of the opisthonotum there are 7 setae. On the anterior margin of the ventro-anal shield there are two setae.

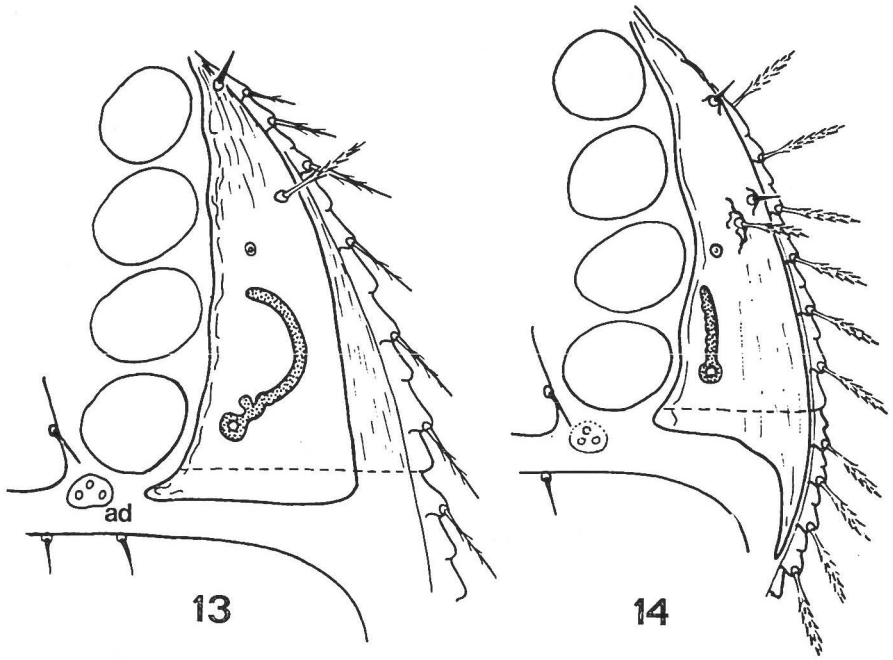


FIG. 13 : *Zercon* C. L. Koch — The peritremal shield.
FIG. 14 : *Parazercon* Trägårdh — The peritremal shield.

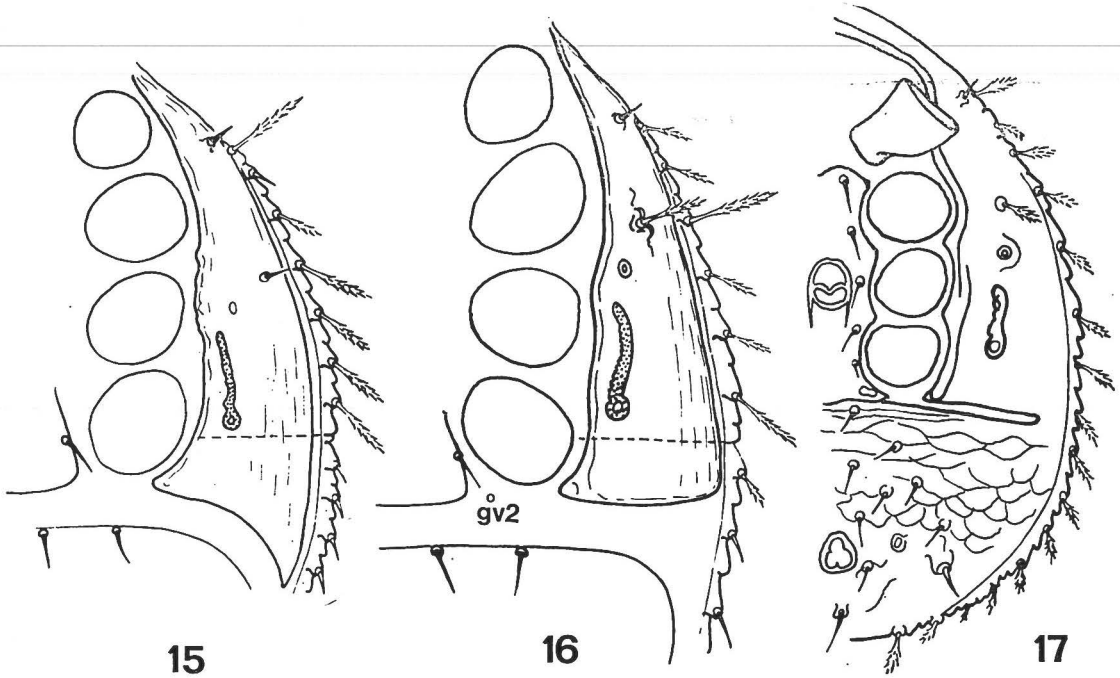


FIG. 15 : *Prozercon* Sellnick — The peritremal shield.
FIG. 16 : *Mixozercon* Halašková — The peritremal shield.
FIG. 17 : *Amerozercon* Halašková — Venter of male (after Halašková).

Prozercon Sellnick, 1943.

Typus generis : *Zercon fimbriatus* C. L. Koch, 1839.

The peritremal shield extends posteriorly, especially its lateral external end which extends to seta R5 (Fig. 15). On the peritremal shield, there are two setae, p1 and p2, both short and smooth. The adgenital shields are absent. On the margin of the opisthonotum there are 8 setae. On the anterior margin of the ventro-anal shield, there are two setae.

Mixozercon Halašková, 1963.

Typus generis : *Parazercon sellnicki* Schweizer, 1948.

The peritremal shield terminates truncately posteriorly behind the fourth pair of coxae (Fig 16). On the peritremal shield, there are two setae, p1 short and smooth and p2, long and feathered. The peritremal shield reaches to the margin of the podonotum. The adgenital shields are absent (there is only a single opening of the glands — gv2). On the margin of the opisthonotum there are 7 setae. On the margin of ventro-anal shield, there are four setae.

Amerozercon Halašková, 1969.
(Diagnosis after Halašková).

Typus generis : *Amerozercon suspiciosus* Halašková, 1969.

Instead of the adgenital sclerites, on the sides of the genital shield, there are slightly conspicuous pores of a considerable size (Fig. 17). The peritremal shield is cut ap in a transverse direction behind the fourth pair of coxae and is connected with the ventro-anal shield on the sides. On the peritremal shield, there are two setae, the first one short, smooth — p1 — the second one long and feathered — p2. The slit separating the peritremal shield from the podonotum is absent. The large ventro-anal pores are situated anterolaterally from the insertion of the adanal setae. The depressions are, conspicuous and well sclerotized. All the marginal setae are strongly feathe red. The pores Po3 are absent. The marginal teeth of the body are short, not sharp.

Microzercon gen. nov.

Typus generis : *Prozercon californicus* Sellnick, 1958.

The peritremal shields extends posteriorly, especially the lateral external ends, which are connected with the ventro-anal shield ; the last shield exhibits deep incisions reaching to the base of seta R4. On the peritremal shield, there are two setae p1 and p2, both short and smooth (Fig. 1). The peritremal shields reaches to the margin of the podonotum. The adgenital shields are not mentioned in Sellnick's description. On the margin of opistonotum there are 8 setae.

Macrozercon gen. nov.

Typus generis : *Prozercon praecipuus* Sellnick, 1958.

The peritremal shield terminates truncately posteriorly behind the fourth pair of coxae (Fig. 2). On the peritremal shield, there are two setae, p1 and p2, both short and smooth. The

ventro-anal shield has two deep lateral incisions reaching over seta R5. The adgenital shields are not mentioned in Sellnick's description. On the margin of the opisthonotum there are 8 setae.

Mesozercon gen. nov.

Typus generis : **Mesozercon coreanus** sp. nov.

The peritremal shields extends posteriorly especially the lateral external ends which extend over the setae R3 (Fig. 6). On the peritremal shield, there are two setae, p1 and p2, both short and smooth. The adgenital shields are absent. There are only opening of the glands gv2. On the margin of the opisthonotum there are 7 setae. On the anterior margin of the ventro-anal shield there are foure setae.

Echinozercon gen. nov.

Typus generis : **Echinozercon orientalis** sp. nov.

The peritremal shields extends posteriorly, especially the lateral external ends which extend over the base of seta R4. (Fig. 9). On the peritremal shield, there are two setae, p1, long and feathered and p2, short and smooth. The frontal part of the peritremal shields has a characteristic sculpture. The peritreme is very long and reaches over the insertion of seta p2. The adgenital shields are absent. On the margin of the opisthonotum are the 11 setae. On the anterior margin of the ventro-anal shield there are two setae.

Metazercon gen. nov.

Typus generis : **Metazercon athiasae** sp. nov.

The peritremal shield terminates truncately, posteriorly behind the fourth pair of coxae (Fig. 11). On the peritremal shield there are two setae, p1 (20 μm) smooth, p2 twice as long as seta p1 and delicately pilose. The peritreme reaches only to the posterior margin of the third pair of coxae. The postero-lateral part of the peritremal shield has a characteristic incision. Between the peritremal shield and the margin of the podonotum is a wide weakly sclerotized slit. The adgenital shields are present with two pores. Between the genital shield and the ventro-anal shield lie two narrow sclerites without setae. On the margin of the opisthonotum there are 8 setae. On the anterior margin of the ventro-anal shield there are four setae.

After completion of the new data, the characteristics of the family Zerconidae are as follows :

The dorsal shield in all stages is divided into the podo- and opisthonotum. The margin of the body is serrated and bears setae. On the posterior part of the opisthonotum there are two or four, more or less heavily sclerotized cavities, either in one row in adult, deutonymph and protonymph or in two rows in larva. On the adult podonotum there are 18-21 pairs of setae and on the opisthonotum 21-26 pairs. On the dorsal side, lies 3 pores on the podonotum and 4 pores on the opisthonotum (Po — from Sellnick and gd from ATHIAS-HENRIOT). On the ventral

side there are 4 pores-gv. The peritremal shield has two or three setae. The hypostomal groove is longitudinally striated. The peritreme ranges from very short (reaching only to the posterior margin of the third pair of coxae) to very long (reaching over the insertion of seta p2). The ventro-anal shield has 8-9 pairs of setae. Sexual dimorphism : in males, the sternal, metasternal and genital shields are fused into the sterno-genital shield, with the genital orifice being located in the middle, between the coxae of the second pair of legs. Chelicerae in males without spermatodactyl process. Insemination of the type tocospermie.

Key to the genera Zerconidae
(*adult stage*)

1. The peritremal shield is connected with ventro-anal shield (Figs. 1 and 17)..... 2
—. The peritremal shield is free..... 3
2. Seta p2 is short and smooth (Fig. 1). The peritremal shields extends posteriorly, especially the lateral external ends which are connected with the ventro-anal shields forming deep incisions reaching to the base of seta R4..... **Microzercon** gen. nov.
—. Seta p2 is long and plumose (Fig. 17). The peritremal shield is out in a transverse direction behind the fourth pair of coxae and is connected with the ventro-anal shield along the sides..... *Amerozercon* Halašková
3. The peritremal shield terminates truncately posteriorly behind the fourth pair of coxae (Figs. 2, 11, 13, 16)..... 4
—. The peritremal shield extends, posteriorly especially the lateral external end which extend over seta R3 (Figs. 6, 9, 14, 15)..... 7
4. Seta p2 is short and smooth. The ventro-anal shield has a deep lateral incision (Fig. 2)..... **Macrozercon** gen. nov.
—. Seta p2 is long, pilose or plumose. The ventro-anal shield is entire and does not have incision (Figs. 11, 13, 16)..... 5
5. The adgenital shields are absent. The peritremal shield reaches to the margin of the podonotum (Fig. 16)..... *Mixozercon* Halašková
—. The adgenital shields are present. Between the peritremal shield and the margin of the podonotum is a wide weakly sclerotized slit (Figs. 11, 13)..... 6
6. Postero-lateral part of the peritremal shield with incisions. Between the genital and ventro-anal shields lie two sclerites (Fig. 11)..... **Metazercon** gen. nov.
—. Postero-lateral part of the peritremal shield without incisions. Between the genital and ventro-anal shields the sclerites are absent (Fig. 13)..... *Zercon* C. L. Koch
7. On the peritremal shield there are three setae (Fig. 14)..... *Parazercon* Trägårdh
—. On the peritremal shield there are two setae (Figs. 6, 9, 15)..... 8
8. The opening of the glands gv2 are present (Fig. 6)..... **Mesozercon** gen. nov.
—. The opening of the glands gv2 are absent (Figs. 9, 15)..... 9
9. Seta p1 is long and plumose. Peritreme reaches over the base of seta p2 (Fig. 9)..... **Echinozercon** gen. nov.
—. Seta p1 is short and smooth. Peritreme never reaches to the insertion of seta p2..... *Prozercon* Sellnick

Summary

In the present paper the author has made the revision of the family Zerconidae genera on basis of the following features : Shape of the peritremal shield ; Number and shape of setae on the peritremal

shield ; Presence or absence of adgenital shield ; The connection or separation of the peritremal and ventro-anal shield ; Length of the peritreme. Author has redescribed two species described by SELLNICK, 1958 namely : *Prozercon californicus* Sellnick including this species to genus *Microzercon* gen. nov., and *Prozercon praecipuus* Sellnick to genus *Macrozercon* gen. nov. Author has established three new genera in the North Corean material namely : *Mesozercon* gen. nov., *Echinozercon* gen. nov., *Metazercon* gen. nov. Author has to the paper included the key and diagnoses all the genera the family Zerconidae.

RÉSUMÉ

L'auteur a revisé des genres de la famille des Zerconidae en fonction des caractères suivants : La forme du peltidium ; le nombre et la forme des poils sur le peltidium ; l'existence ou l'absence des sclérites aggenitaux ; la jonction ou la séparation du peltidium et du sclérite ventro-anal ; la longueur du péritrème. L'auteur a fait la redescription de deux espèces décrites par SELLNICK, notamment *Prozercon californicus* Sellnick l'attribuant au genre *Microzercon* gen. nov., et *Prozercon praecipuus* Sellnick au genre *Macrozercon* gen. nov. Dans le matériel d'Asie de l'Est (Corée) l'auteur a distingué 3 nouveaux genres notamment : *Mesozercon* gen. nov., *Echinozercon* gen. nov., *Metazercon* gen. nov. L'auteur insère la clé et les diagnoses de tous les genres de la famille des Zerconidae.

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