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***Reicheiodes microphthalmus* (HEYDEN, 1870) from the north-western Iberian peninsula, with a description of the new subspecies *Reicheiodes microphthalmus assmanni* ssp. n.**

(Coleoptera: Carabidae, Scaritinae)

With 7 figures

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Summary

Reicheiodes microphthalmus (HEYDEN, 1870) is redescribed. A study of 7 populations from the north-western Iberian peninsula revealed that the species occurs in a southern and a northern subspecies separated by the valley systems of the Rio Niño and Rio Sil. The new subspecies *Reicheiodes microphthalmus assmanni* ssp. n. is described, illustrated, and compared with *Reicheiodes microphthalmus microphthalmus* (HEYDEN).

Zusammenfassung

Reicheiodes microphthalmus (HEYDEN, 1870) wird redescribiert. Untersuchungen an 7 Populationen aus Nordwestspanien zeigen, daß die Art in einer südlichen und einer nördlichen Subspecies vorkommt, die durch die Talsysteme des Rio Niño und Rio Sil getrennt sind. Die neue Subspecies *Reicheiodes microphthalmus assmanni* ssp. n. wird beschrieben, illustriert, und mit *Reicheiodes microphthalmus microphthalmus* (HEYDEN) verglichen.

Keywords

Coleoptera - Carabidae - Scaritinae - *Reicheiodes* - taxonomy - Spain

Introduction

Until 1990, occurrence of 8 *Reicheiodes* species was known from several mountain regions in the Alps, Croatia, Japan, China, and the Iberian peninsula. Recently, some new species were discovered in the Himalayas and Caucasus, doubling the number to 16 species described. It is interesting that no species is found in the Pyrenees, and only one species, *Reicheiodes microphthalmus* HEYDEN, is yet known from the Iberian peninsula.

Some *Reicheiodes* material became available as a result of collecting trips carried out recently in the north-western Iberian peninsula by Dr. T. ABMANN, W. STARKE, A. HETZEL, and the author. Beside *Reicheiodes microphthalmus* (HEYDEN, 1870), the material consists of remarkable populations belonging to a new subspecies of *R. microphthalmus* described in this contribution. For proper description and comparison, *Reicheiodes microphthalmus* is redescribed and the holotype was studied.

Material and Methods

The material is deposited in the following collections:

DEI	Deutsches Entomologisches Institut, Eberswalde, Germany
MHNG	Muséum d'histoire naturelle, Genève, Switzerland
NMPC	Národní Muzeum (Natural History), Praha, Czech Republic
CAB	Collection Dr. THORSTEN ABMANN, Bissendorf near Osnabrück, Germany
CBA	Collection of author, Denzlingen near Freiburg, Germany
CHM	Collection ANDREAS HETZEL, Münster, Germany
CSW	Collection WERNER STARKE, Warendorf near Münster, Germany
CWB	Collection DAVID WRASE, Berlin, Germany

Other abbreviations

EI: relative eye index, HT: holotype, PT: paratype, x: arithmetic mean (used in descriptions of measurement)

Magnifications between 40 and 66 X were used for investigation. Measurements were taken at a magnification of 50 and 66 X using an ocular micrometer (Zeiss: Stemi SV 11). Total length was measured including closed mandibles. The length of the elytra does not include the pedunculus. The width was measured at the maximum width of both elytra and represents the general width of the specimens. The length of the pronotum is measured along the median line including the flange-like base, and the width is determined at the widest part. A minimum 15 specimens of each subpopulation was measured. Some of these measurements are used to obtain ratios of the pronotum and elytra. These data may help in expressing the relative body shape, including ranges.

In general, terms, descriptions of characters and methods were based on BALKENOHL (1999). The eyes of *Reicheiodes microphthalmus* and the new subspecies are reduced to a different degree. So, only small parts of the eyes are located dorsally. This character is conspicuous but hard to judge if only single specimens are on hand. For expressing the degree of eye reduction more precisely, a ratio - the "relative eye-index" - is determined (for full explanation of method see BALKENOHL 1999).

The genitalia dissected were mounted in a medium according to LOMPE (1989). A small transparent Celon-card was used instead of a paper-card. These Celon-cards are stored on the same needle as the specimens but were placed on a slide for microscopic observation. The aedeagi are strongly sclerotized and were treated with KOH to clear up inner structures. Magnification of 100 to 400 X was used for microscopic investigation of the aedeagi (Olympus CH-2). Dissected specimens are indicated separately under material as males/ females.

The old material bears several labels. All label information is listed for each of those specimens, separated for each label by a dash. In my opinion this is an extremely important proof for unequivocal identification of the holotype. The original pins have been reused and the old paper cards have been mounted additionally to the pins. This was done to keep all information available for future investigation.

In total, 360 newly-collected specimens were used for the investigation. In addition there were 47 specimens available among unidentified material deposited in the Muséum d'histoire naturelle, Genève, and 5 specimens in the collection D. WRASE, Berlin, all enriching this contribution. Together with the type- and other old material the investigation is based on a total of 412 specimens.

***Reicheiodes microphthalmus* HEYDEN, 1870**

The species occurs in a southern and a northern subspecies separated by the valley systems of the Rio Niño and Rio Sil. Occurrence of the species has been pointed out by JEANNE (1976), JEANNE & ZABALLOS (1986), NOVOA et al. (1989), ZABALLOS & JEANNE (1994), and PILOÑA & VALCÁRCEL (1996).

Diagnosis

A small species with ovoid and transversally conspicuous convex elytra, pronotal reflexed lateral margin reaching over the posterior setigerous puncture, and with irregular sculptured anterior transverse line of the pronotum incomplete at extremities. Chaetotaxy of the elytron is as follows: 1 basal-, 3 subhumeral-, 3 umbilical-, 2 praecapical-, and 4-5 third interval dorsal setigerous punctures. Distinguished from the related species *Reicheiodes alpicola* GANGLBAUER and *R. rotundipennis* CHAUDOIR mainly by the strongly reduced eyes and markedly developed genae, and the ovoid shaped elytra which have a conspicuous setigerous puncture at each side of the base.

***Reicheiodes microphthalmus microphthalmus* HEYDEN, 1870**

(Figs 1, 3, 5)

Dyschirius microphthalmus HEYDEN, 1870: 58;*Dyschirius microphthalmus* HEYDEN 1870; MARSEULE 1880: 202;*Dyschirius (Reicheiodes) microphthalmus* HEYDEN 1870; REITTER 1891: 16;*Dyschirius (Reicheiodes) microphthalmus* HEYDEN 1870; FLEISCHER 1899: 32;*Dyschirius microphthalmus* HEYDEN 1870; MÜLLER 1922: 114;*Dyschirius (Reicheiodes) microphthalmus* HEYDEN 1870; CSIKI 1927: 545;*Reicheiodes (Iberiodes) microphthalmus* HEYDEN 1870; DOSTAL 1993: 101;*Reicheiodes microphthalmus* HEYDEN 1870; FEDORENKO 1996: 211.**Material examined**

A. Type material. Holotype: ♂, labels: white: Sr. Gerez Lusitaniae 4.7. Heyden / white, small, triangle-like: without notes / white: orig / pale-red, small, square: without notes / white: Coll. Heyden / red, printed: Holotypus / white: coll. L.v. Heyden DEI Eberswalde (DEI).

Comments: LUCAS VON HEYDEN based his description on a single specimen: „Ich fand ein Exemplar in der Sierra de Gerez in Nordportugal am 4. Juli 1868 beim Aussieben von dichtem Moose in einer Höhe von fast 7000 Fuß.“ (HEYDEN 1870, p. 58, 59). This specimen is available in coll. VON HEYDEN (DEI) and was studied.

B. Other material. 1 spec., (without abdomen), labels: white with black frame: Gerez 3 84 / white: D. microphthalmus Heyd. / white: microphthalmus Heyd Wagner det. / white small: coll. Stierlin / white: coll. DEI Eberswalde (DEI); 1 spec., labels: white with black frame: Gerez 3 84 / red, printed: TYPUS / white: Heyden versim / white: microphthalmus Heyd. typ / red: Mus. Nat. Pragae Inv. 65870 (NMPC); 1 spec. (immatur), labels: white: microphthalm. Lusitania Paulino / white, small, printed: GEREZ / pale-red, small, square: without notes / white: Coll. Heyden / white: coll. L.v. Heyden DEI Eberswalde (DEI); 16 specs., N-Portugal, Sierra do Gerêz, Portela de Leonte/Portela do Homem, 10.6.1997, leg. Th. Aßmann (CAB); 1 spec., P-Serra do Gerez, 800 m, Eichenstreu, 26.05.1992, leg. Wunderle (CWB); 3 ♂, 4 ♀, 4 specs., P, Sierra do Gerêz, nr. Gerêz/Portela do Homem, 850 m, *Fagus* forest, 10. VI.1997, leg. Balkenohl (CBA); 4 specs., P-Braga, Serra do Gerêz, 700 m, Portela do Homem, 19.5.1997, leg. Starke (CSW); 3 ♂, 1 ♀, 44 specs., Portugal, Porto, Serra do Marao, 9.6. 1966, leg. Cl. Besuchet (MHNG/CBA); 3 specs., V. Real, Arrabaes, 600 m, 27.7.1981, leg. I. Löbl (MHNG/CBA); 10 specs., same data but Alto de Espinho, 800 m, 10.6.1997, leg. Th. Aßmann (CAB); 2 ♂, 1 ♀, 80 specs., same data but Boavista, leg. M. Balkenohl (CBA).

Comments: FEDORENKO (1996) quoted the specimen from NMPC as „holotype“. This is incorrect due to the following reasons: The label of the holotype shows verbatimly day and month published by VON HEYDEN (1870, p. 59). In addition, comparison of VON HEYDEN's handwriting revealed authenticity. According to HORN, et al. (1990), VON HEYDEN's collection of Palaearctic Coleoptera went to the DEI in 1915 and is still deposited there separately. This collection also includes the holotype of *Dyschirius microphthalmus* confirmed by the original card-index inspected as well as confirmed by Dr. L. ZERCHE. However, the date of collection of the specimen in NMPC is „3 1884“ as it is identically in one of the other specimens from DEI. These 2 specimens were collected 16 years after VON HEYDEN collected the first specimen and 14 years after the description was published. Consequently, these specimens can not represent typematerial.

Diagnosis

Distinguished from the northern subspecies mainly by the smaller eyes, the more distinct 6th stria of the elytron, and structures of the orificium on the aedeagus.

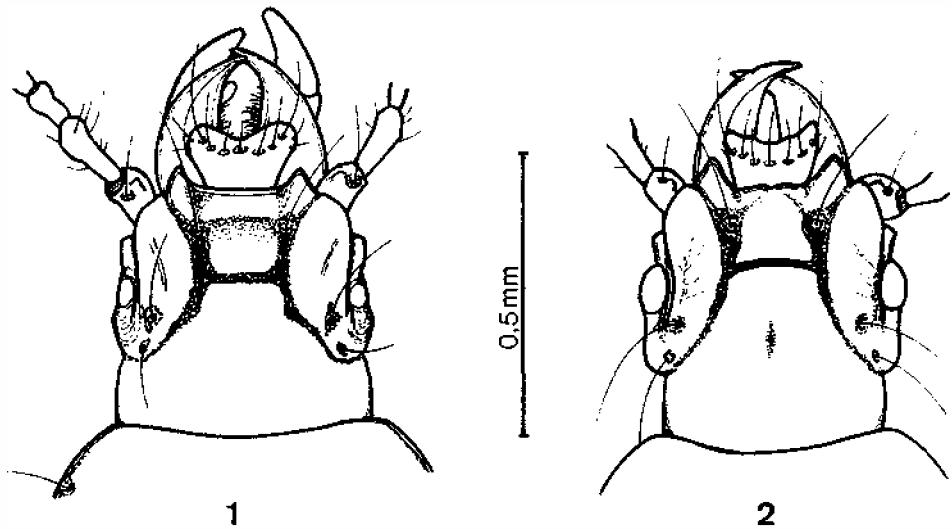


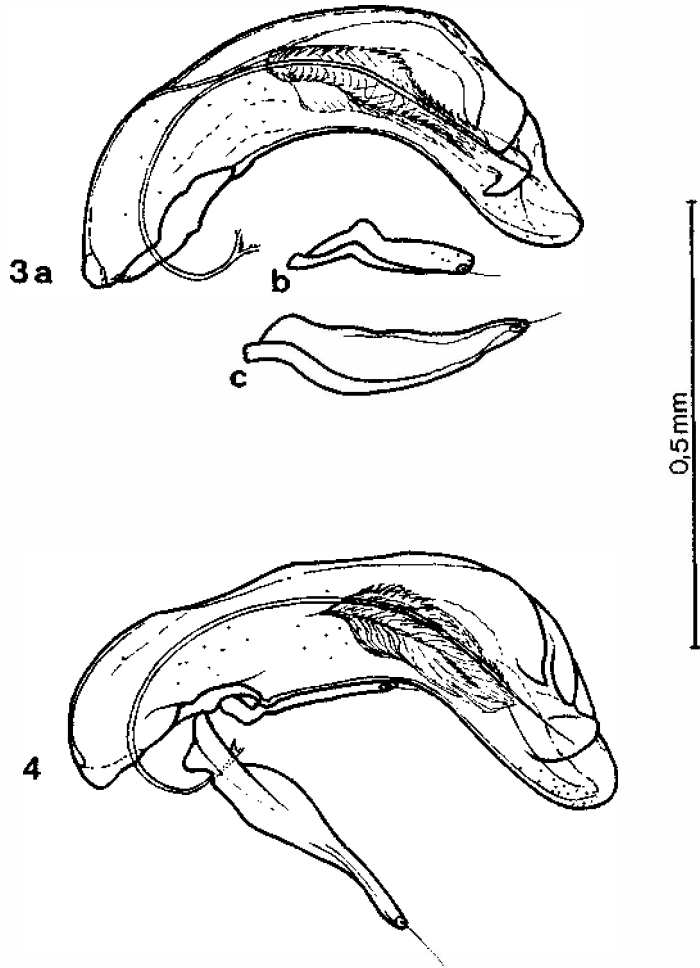
Fig. 1. *Reicheiodes microphthalmus microphthalmus* HEYDEN. Head, dorsal view. - Fig. 2. *Reicheiodes microphthalmus assmanni* ssp. n. Head, dorsal view.

Redescription

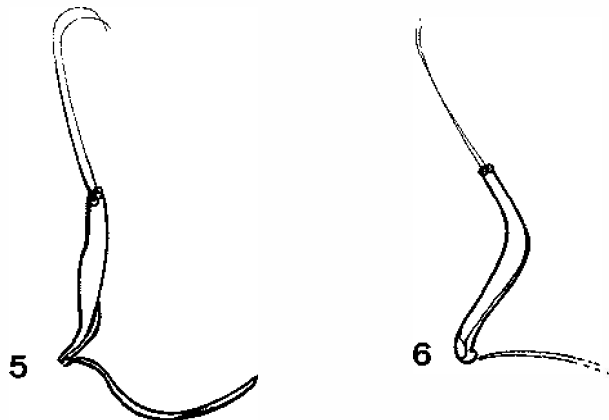
Measurements: Length 2.44 - 2.95 mm ($x = 2.77$ mm*), width 0.83 - 1.16 mm ($x = 0.99$ mm*), ratio length/width of pronotum 0.84 - 0.98 ($x = 0.91$ *), ratio length/width of elytra 1.40 - 1.51 ($x = 1.46$ *); (* $n = 40$). EI 4.80 - 7.81 ($x = 5.80$), $n = 49$.

Colour: Head, pronotum, ventral surface, mandible, and front femur red-brown, with circle of dark pigment enclosing eyes. Mouthparts, antennae, front tibia, intermediate and hind legs light red-brown, elytron dark brown with suture, base, and apex paler.

Head (Fig. 1): Two-fifth smaller than pronotum. Clypeus, lateral tooth finely margined. Clypeus stright anteriorly, lateral teeth projecting, obtuse at tip, devided from supraantennal plates by distinct notches; clypeal field square, anteriorly deplanate, posteriorly conspicuously convex, smooth, separated from frons by deep straight transverse furrow; frons convex, smooth; supraantennal plates moderately convex, with fine carina at top of vault. Frontal furrows deep, broad, diverging anteriorly and posteriorly of transverse furrow. Neck constriction absent.



Figs 3 a-c. *Reicheiodes microphthalmus microphthalmus* HEYDEN. ♂ genitalia: aedeagus ventral view (a), dorsal and ventral paramere (b, c). - **Fig. 4.** *Reicheiodes microphthalmus assmanni* ssp. n. ♂ genitalia: aedeagus ventral view with parameres. - **Fig. 5.** *Reicheiodes microphthalmus microphthalmus* HEYDEN. ♀ genitalia: Stylomere. - **Fig. 6.** *Reicheiodes microphthalmus assmanni* ssp. n. ♀ genitalia: Stylomere.



Eyes conspicuously reduced, flat, $EI \times = 5.80$ (see Fig. 7), facets hardly distinguishable; genae conspicuous, slightly higher than eyes, regularly rounded, surface with longitudinal carinae. Antennae relatively long, extending beyond posterior setigerous puncture of pronotum by nearly 2 segments, scapus with 1 apical seta situated dorsally, with tubercle near apex, segments 5 - 10 elongate (1.25 x longer than wide). Labrum 7-setose, with isodiametric reticulation. Mandible moderately slender, arcuate apically. Terminal segment of maxillary palp bottle-like, slender at apex.

Pronotum: Globose, in lateral view conspicuously convex posteriorly. Wider than long, maximum width slightly behind middle; lateral border less strongly rounded anterior middle and from posterior setigerous puncture to base; reflexed lateral margin reaching from rounded anterior angles over posterior setigerous puncture; lateral channel fine, median line distinct, deeper at base, joining anterior transverse line; anterior transverse line flat, not reaching extremities, formed by irregular rugae; surface with few fine transverse wrinkles laterally; flange small, inconspicuous.

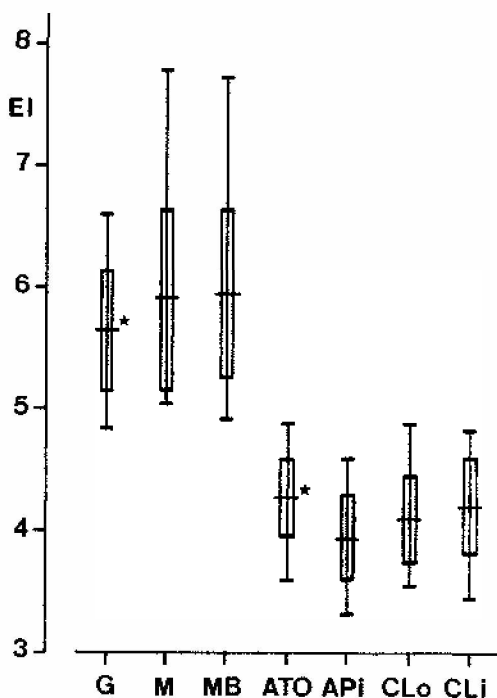


Fig. 7. Relative Eye-Index (EI) of 7 different populations. Mean, absolute range, and standard deviation (s) is given. For calculation of the relative eye-index, see text. G: Sierra do Gerêz; Portela do Homem nr. Gerêz (n = 19); M: Sierra do Marao (n = 15); MB: Sierra do Marao, Boavista (n = 15); ATO: Sierra de Ancares, Tres Obispos (n = 16); APi: Sierra de Ancares, Piornedo (n = 15); CLo: Sierra de Courel, Louzarella (n = 15); CLi: Sierra de Courel, Liñares (n = 15). *: according to bilateral U-test, populations with overlapping ranges are significantly different with an error $\alpha \geq 0.02$.

Elytron: Lateral view: Conspicuously convex on disc, perpendicularly falling at basal declivity. Outline ovoid, maximum width anterior middle, margin less strongly rounded at base and in posterior half, margined from pedunculus to apex; humeral angle broadly rounded but visible; lateral channel moderately broad, fine at base and apex; reflexed margin distinct from pedunculus to apex. Basal granula absent; basal setigerous puncture conspicuous, situated in projected extension of 2nd stria. Three subhumeral, 3 umbilical, 2 praeapical setigerous punctures; scutellar stria absent. Stria 1, 2 deep, and 3 moderately deep, all with punctures partly connected, stria 4 - 6 developed as rows of punctures becoming very fine laterally. Intervals 1 - 3 slightly convex, others flattened. Interval 3 with 4 - 5 setigerous punctures, 2nd interval with 1 fine setigerous puncture at apex. First stria reaching apex, all others obliterated in apical third.

Ala: Atrophied to minute rudiment.

Ventral surface: Proepisternum with fine transverse wrinkles. Abdominal sternites smooth, terminal segment with fine transverse wrinkles, 2 apical setigerous punctures widely distant. Protibia: Lateral upper spine curved distinctly ventral and slightly lateral. Movable spur finer than spine, curved feebly. Praeapical lateral denticle strong, 2nd much smaller, both sharp. ♂ genitalia: Aedeagus (Fig. 3a): Median lobe strongly sclerotized, regularly arcuate, broadened in apical half in lateral view, apex rounded. Orofium large, closing lips broad and partly sclerotized. Endophallus with minute teeth. Parameres (Figs 3 b, c), with seta at apex. ♀ genitalia: Stylomere sigmoid, slender, with 2 conspicuously long setae at apex (Fig. 5).

Distribution: The species is found from northern Portugal up to the Rio Niño - Rio Sil valley in north-western Spain.

Variation: Some variability was observed in the development of the pronotal anterior transverse line in the 176 specimens investigated. In most of the specimens the rugae are moderately developed, in some specimens they are very broad, in others absent and only the flat impression is visible. The fine setigerous puncture situated in the 2nd interval at apex is missing in about 10% of the specimens seen. For variation of dorsal setigerous punctures see Tab. 1.

Habits: The newly-collected material was sifted from moist leaf litter mostly in *Fagus* but also in *Quercus* forests at an altitude of 600 - 900 m, but single specimens were in addition found under embedded stones.

***Reicheiodes microphthalmus assmanni* ssp. n.**

(Figs 2, 4, 6)

Type material

Holotype: ♂, España, Galicia, Lugo, Sierra de Ancares, Tres Obispos, nr. Donis, 1300 m, *Ilex-Quercus* forest, 12. VI. 1997, leg. M. Balkenohl (DEI).

Paratypes: 1 ♂, 5 ♀ 21 specs., same data as HT (DEI/CBA); 2 specs., same data but 12/13.6. 1997, leg. T. Aßmann (CAB); 1 ♀, 2 specs., same data but VI. 1997, leg. T. Aßmann (CAB); 12 specs., same data but 17.5.1997 (CAB); 1 ♂, 21 specs., same data but Tres Obispos nr. Degrada, 1100 m, 13.5.1997, leg. W. Starke (CSW); 17 specs., same data but 17.5.1997 (CSW); 16 specs., same data but N 42°49'18'', W 06°53'59'', 29.5.1998, leg. W. Starke (CSW); 5 ♂, 15 specs., E, Galicia, Sierra de Ancares, Piornedo-Mustellar, 1500 m, 31.5. 1996, leg. W. Starke (CSW); 3 specs., same data but (CWB); 17 specs., same data but 29./30.5.1998, leg. A. Hetzel (CHM); 17 spec., same data but Piornedo, 1100 m, 16.5.1997, leg. W. Starke (CSW); 8 specs., NW-Spain, Lugo, Sierra de Courel, Lifiáres, *Fagus* stand, 1200 m, 27.5.1996, leg. T. Aßmann (CAB); 8 specs., same data but Lugo LU 634, Lifiáres, 1000 m, 27.5.1996, leg. W. Starke (CSW); 1 spec. same data but (CWB); 1 ♂, 21 specs., same data but 1000 m, 11. VI. 1997, *Fagus* forest, leg. M. Balkenohl (CBA); 8 specs., same data but Lifiáres, Puerto el Poyo, 11.6.1997, leg. T. Aßmann (CAB); 7 specs., Lugo, Sierra de Courel, Louzarella, *Quercus* stand, 1100 m, 27.5.1996, leg. T. Aßmann (CAB); 5 specs., same data but Fonfria-Louzarella, leg. W. Starke (CSW); 14 specs. same data but Puerto el Poyo, Louzarella, mixed *Erica arborea* forest, 11.6.1997, leg. T. Aßmann (CAB); 6 specs., same data but leg. M. Balkenohl (CBA); 3 specs., same data but 31.5.1998, leg. A. Hetzel (CHM).

Remarks: The HT and some of the PT have been given to DEI.

Diagnosis

Distinguished from the southern nominate subspecies mainly by the bigger eyes, the extremely weakly developed striae 6 of the elytra, and structures of the orofium of the aedeagus.

Description

Measurements: Length 2.60 - 3.05 mm ($x = 2.82$ mm*), width 1.02 - 1.15 mm ($x = 1.08$ mm*), ratio length/width of pronotum 0.88 - 0.97 ($x = 0.93$ *), ratio length/width of elytra 1.36 - 1.48 ($x = 1.46$ *); (* $n = 46$). EI 3.32 - 4.92 ($x = 4.14$), $n = 60$.

In the following only the differences to the nominotypical subspecies are listed:

Antennae yellow-red, circle of pigment around eyes less distinct; clypeus slightly bisinuate anteriorly; clypeal field diverging posteriorly, separated from frons by deep slightly convex transverse furrow; supraantennal plates with some fine transverse wrinkles; eyes reduced but still convex (Fig. 2), EI $x = 4.14$ (see Fig. 7), facets convex, distinctly visible; eyes slightly higher than genae, genae prolonged posteriorly thought having a rounded angle; stria 6 of elytron hardly traceable; 3rd interval with 4 - 6 setigerous punctures, variable on right and/or left elytron.

♂ genitalia: Aedeagus (Fig. 4): Median lobe strongly sclerotized, more distinct arcuate at middle, broadened in apical half in lateral view, apex broadly rounded. Oroflicium large, closing lips broad and partly sclerotized. Endophallus with minute teeth. Parameres (Fig. 4), with seta at apex.

♀ genitalia: Stylomere indistinctly sigmoid, slender, 2 conspicuously long apical setae hook-like at apex (Fig. 6).

Distribution: The subspecies is found north of the Rio Sil - Rio Niño valley in the Sierra de Ancares and Sierra de Courel.

Variation: The characters of the head given in the above description are valid in about 85 % of the specimens seen. The median impression on the frons is visible in all populations of each subspecies without a definite trend. However, the differences in eyes and genae obviously have a relatively constant difference (Fig. 7). For variation of the dorsal setigerous punctures see Tab. 1. Of all specimens seen, 1 was found having 1 additional seta on interval 2 near base.

Remarks: For 2 populations of each subspecies (Sierra do Gerêz ; Sierra de Ancares, Tres Obispos) the ranges of the EI are slightly overlapping. However, according to the bilateral U-test performed the difference is significant with $\alpha \geq 0.02$.

Habits: The specimens were sifted from moist leaf litter in *Fagus*, *Quercus*, *Ilex*, and *Erica* forests at an altitude of 1000 - 1500 m.

Etymology: The subspecies is dedicated to Dr. Thorsten Aßmann who collected much of the new material examined.

Tab. 1. Number of setigerous punctures on the 3rd interval of the elytra. 105 specimens investigated.

n setae on the 2 elytra of one specimen	<i>Reicheiodes microphthalmus microphthalmus</i> HEYDEN [n specimens]	<i>Reicheiodes microphthalmus assmanni</i> n. ssp. [n specimens]
4/3	7	4
4/4	34	12
4/5	8	24
5/5	-	12
4 or 5/6	-	4

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I thank Dr. L. ZERCHE (DEI) for the loan of the HT and other material as well as for the information regarding the HT. Special thanks are due to Dr. T. AßMANN (Bissendorf) for showing me some of the collecting sites and for making material available. Dr. J. JELÍNEK (NMPC) loaned me a valuable specimen seen by VON HEYDEN. The following persons provided additional material for the study: W. STARKE (Warendorf), A. HETZEL (Münster), D. WRASE (Berlin) and Dr. I. LÖBL (MHNG).

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