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| Z.Arb.Gem.Öst.Ent. | 51 | 109-118 | Wien, 15. 12. 1999 | ISSN 0375-5223 |
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## Revision of the genus *Axonya* ANDREWES, 1923 (Coleoptera: Carabidae)

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### Abstract

The genus *Axonya* ANDREWES, 1923 is revised. Two species are newly described: *Axonya farsica* nov. spec. from Iran and *Axonya similis* nov. spec. from Nepal and Northeast India. *Axonya championi* ANDREWES, 1923 is redescribed and revised, and a lectotype is designated. A key to the species is provided.

### Zusammenfassung

Es wird die Gattung *Axonya* ANDREWES, 1923 revidiert. Zwei Arten werden neu beschrieben: *Axonya farsica* nov. spec. aus dem Iran und *Axonya similis* nov. spec. von Nepal und Nordost-Indien. *Axonya championi* ANDREWES, 1923 wird neu definiert und beschrieben sowie ein Lectotypus festgelegt. Die Arten werden in einer Bestimmungstabelle aufgeschlüsselt.

Key words: Coleoptera, Carabidae, Broscinae, *Axonya*, new species, key, lectotype designation, India, Iran, Nepal.

### Introduction

The Genus *Axonya* ANDREWES, 1923 belongs to the subfamily Broscinae. Its description is based on a single reference species, *A. championi* ANDREWES, 1923, with a few records from North India. No further species has been included so far, and no publications on *Axonya* are available since ANDREWES (1935).

The surprising finding of a new species of *Axonya* in southern Iran encouraged the authors to carry out a more detailed taxonomic study on this poorly known genus. In the course of examining the material of *A. championi* deposited in the Natural History Museums in London and Vienna, a third species could be differentiated, which differs from *A. championi* mainly in some details of head structures and male genitalia.

### Acronyms of depositories:

|      |                                                    |
|------|----------------------------------------------------|
| BMNH | The Natural History Museum, London, United Kingdom |
| CDV  | Coll. A. Dostal, Vienna, Austria                   |
| CZV  | Coll. H. Zettel, Vienna, Austria                   |
| NHMW | Natural History Museum Vienna, Austria             |

## Genus *Axonya* ANDREWES, 1923

*Axonya* ANDREWES 1923: 679-681; 1924: 22, Taf. 2, Fig. 5, 5a-b; 1926: 68; 1935: 33, 40-42; CSIKI 1929: 11.

Type species: *Axonya championi* ANDREWES, 1923 (by monotypy).

### Description

Head: labrum sexsetose, clypeus bisetose, one supraorbital seta on each side; mandibles short, slender, triangular, hooked at apex, with seta in outer furrow; ligula bisetose, apex truncate; lacinia sharply hooked at apex; labial palpomere 2 bisetose; buccal fissure extending backwards beyond base of mentum; mentum wide, with short and sharp tooth in middle of medial sinus, anterior margin of median tooth and epilobes finely bordered, with small denticle between lobes and epilobes, sides of lobes not bordered; median tooth with two basal setae; gula glabrous, with two closely set setae on each side; paragenae sharp; scape unisetose, pedicel asetose, antennomere 3 with apical setae only, antennomere 4 pubescent in apical half as complete following antennomeres.

Pronotum: anterior and posterior margin not bordered; lateral margins bordered, anteriorly rounded, with one single marginal seta at apical fourth, no postangular setae.

Elytra: base not bordered at first five intervals, with setiferous puncture in second stria behind base; without scutellary stria; with 8 dorsal striae, interval 9 with one posthumeral setiferous puncture and with 2 additional (rarely 3) in apical half; one preapical puncture.

Abdominal ventrites with one paramedian seta on each side, anal ventrite in males with one, in females with two closely set apical setae on each side.

Sterna: prosternal process not bordered; metasternal process bordered by row of punctures; metepisterna about 1,8-1,9 times as long as wide.

Legs: tibiae without teeth or spurs on outer margin; protibia dilated apically; tarsi glabrous above; protarsi of males with first three joints dilated and clothed beneath with scaly hairs.

Comparative notes: *Axonya* ANDREWES, 1923 is distinguishable from *Broskosoma* ROSENHAUER, 1846, *Brosca* PANZER, 1813, *Chaetobrosca* SEMENOV, 1900 and *Craspedonotus* SCHAU, 1863 as indicated in the key in ANDREWES 1935: 32-33, from *Miscodera* ESCHSCHOLTZ, 1830 by more slender antennomeres 5 – 11 (in *Miscodera* about 1.5 times as long as wide, in *Axonya* about 2 times as long as wide), and from *Eobrosca* KRYZHANOVSKI, 1951 by the missing deep sulcus in the neck of the head.

### Key to the species

- 1 Clypeus densely and coarsely punctate, similar to densely punctate middle part of head (Fig. 3); dorsal surface with metallic bluish tinge; apex of elytron with distinct orange mark; in lateral view aedeagus subapically broader than 0.5 mm; body length 10.1 mm; Iran . . . . . *Axonya farsica* nov. spec.

- Clypeus glabrous; middle part of head sparsely and finely punctate (Fig. 1, 2); dorsal surface olivaceous; apex of elytron with at most small, indistinct, reddish mark; in lateral view aedeagus subapically narrower than 0.35 mm . . . . . 2
- 2 Supraorbital furrow along inner eye margin as deep and wide as in front of eye, and with vertical wall to inner eye margin (Fig. 2); dorsal surface with light metallic green lustre; apex of aedeagus narrowly rounded, subapically narrower than 0.3 mm; body length 9.0 – 9.6 mm, Nepal, NE-India . . . . .  
*Axonya similis* nov. spec.
- Supraorbital furrow along inner eye margin distinctly narrower and less deep than in front of eye (Fig. 1); dorsal surface with distinct metallic green lustre on head, sides of pronotum and elytra; apex of aedeagus broadly rounded, subapically wider than 0.3 mm; body length 9.0 – 10.2 mm; India (Uttar Pradesh) . . . . . *Axonya championi* ANDREWES, 1923

***Axonya championi* ANDREWES, 1923**

(Figs. 1, 4, 7, 10a-c, 13)

*Axonya championi* ANDREWES 1923: 680-681; 1924: 22, Taf. 2, Fig. 5, 5a-b; 1926: 68; 1935: 33, 40-42, pl. 4: 11a, b; CSIKI 1929: 11.

Color and luster: dark green, tinged metallic green, especially on head, sides of pronotum and elytra and in elytral striae; surface shiny, head and pronotum without microsculpture, elytra with isodiametric microsculpture, antennomeres 1 - 4 reddish-yellow (3 and 4 darker at basis), antennomeres 5 - 11 fuscous, palpi and legs reddish-yellow; labrum and mandibles reddish- to dark brown, ventral surface dark brown to piceous.

Head (Fig. 1): clypeus glabrous or with very few small punctures laterally; middle part of head sparsely and finely punctate, supraorbital furrow along inner eye margin distinctly narrower and less deep than in front of eye; median tooth of mentum broad, truncate, median tooth with more widely separated basal setae; distance of medial gular setae about 4.0 times distance of medial to lateral seta (Fig. 4).

Prothorax (Fig. 13): convex, 0.8 – 1.1 times as wide as long, front angles distinct, not produced; sides rounded and constricted at base; posterior angles distinct but obtuse-angled; posterior margin medially slightly convex; median furrow very fine, not reaching anterior and posterior margin; anterior transverse furrow very slightly impressed in middle of disc; along margins coarsely punctate, disc more finely and sparsely punctate.

Elytra (Fig. 13): 1.6 – 1.7 times as long as wide, sides slightly convex, at shoulders broadly rounded; striae finely punctate-striate, also external ones, punctures in apical half of elytra smaller than in basal half; intervals flat, not convex; epipleura distinctly punctate along inner margin.

Ventral surface: head, proepipleura, meso- and metepisterna, sides of metasternum and of first two abdominal ventrites distinctly punctate; abdominal ventrites 3 - 6 with isodiametric microsculpture, finely punctate at sides.

**Aedeagus** (Fig. 10a – c): distinctly bent in middle of length (Fig. 10a), apex of aedeagus broadly rounded, subapically wider than 0.3 mm; width of right paramere in apical third subequal to maximal width of left paramere (Figs. 10 b, c).

**Legs:** first three joints of protarsi weakly dilated in male (Fig. 7); mesotarsi not dilated in male, first 2 joints clothed beneath with very few, scaly hairs.

**Measurements** (Tab. 1): length 9.0 – 10.2 mm, width 3.25 – 3.8 mm.

**Range:** N-India (Uttar Pradesh).

**Material examined:** Lectotypus (present designation): 1 ♂ 'W-Almora, Kumaon, U. P. India H. G. C.', '*Axonya Championi* ANDR. Cotype H. E. Andrewes det.', 'H. E. Andrewes Coll. B. M. 1945-97', 'Syntype', BMNH.

**Paralectotypes:** 1 ♀, 'Lucknow, Mus. Collr. 6. 11. 08, R. H.', 'Indian Mus. Calcutta', '*Axonya championi* ANDR. Cotype, H. E. Andrewes det.', 'H. E. Andrewes Coll. B.M. 1945-97', in BMNH; 1 ♀, 'Figured specimen', '*Axonya championi* ANDR. Cotype, H. E. Andrewes det.', 'Syntype', in BMNH; 1 ♂, 'W. Almora, Kumaon, U.P., India. H. G. C.', '*Axonya championi* ANDR. Cotype, H. E. Andrewes det.', 'H. E. Andrewes Coll. B.M. 1945-97', in BMNH; 1 ♀, 'Amangarh, Bijnor dist. U. P. 24. 11. 10, Mus. Collr.', '*Axonya championi* ANDR. Cotype, H. E. Andrewes det.', 'Syntype', in BMNH; 1 ♀, 'India', 'Bowring Coll.', '1766', '*Axonya championi* ANDR. Cotype, H. E. Andrewes det.', 'Syntype', in BMNH; 1 ♂, 'W. Almora, Kumaon U. P., India H. G. C.', '*Axonya championi* ANDR. Cotype, H. E. Andrewes det.', 'Syntype', 'H. E. Andrewes Coll. B.M. 1945-97', in BMNH; 1 ♂, 'Bajaura, Kangra district (Indes-Angl.)', 'G. Babault, Juin 1914', '*Axonya championi* ANDR. Cotype, H. E. Andrewes det.', 'Syntype', 'H. E. Andrewes Coll. B.M. 1945-97', in BMNH; 1 ♂, 1 ♀, 'Kumaon, W. Almora, Champion', 'Gesch. 2. 1935 von Andrewes', 'Mikrosk. Präp. MPI 182 ...', 'Van Emden Bequest. B. M. 1960-129', 'Syntype', in BMNH; 1 ♀, 'N India', '*Axonya championi* ANDR. Cotype, H. E. Andrewes det.', 'Syntype', in BMNH; 3 ♂, 2 ♀, 'W. Almora, Kumaon U. P., India, H. G. C.', 'Syntype', 'H. E. Andrewes Coll. B.M. 1945-97', in BMNH; 1 ♀, 'W. Almora Divn, Kumaon U. P., Nov. 1918, H. G. C.', 'Syntype', '2521', 'H. G. Champion, B. M. 1953-156', 1 ♂, 'W. Almora Divn, Kumaon U. P., Nov. 1918, H. G. C.', 'Syntype', '612', '*Axonya championi* Andr., H. E. Andrewes det.', 'H. G. Champion, B. M. 1953-156', in BMNH; 1 ♂, 'W. Almora, Kumaon U. P., India. H. G. C.', 'Syntype', 'H. E. Andrewes Coll. B.M. 1945-97', in BMNH; 1 ♀, '*Axonya championi* ANDR. Cotype, H. E. Andrewes det.', 'Syntype', 'H. E. Andrewes Coll. B.M. 1945-97', in BMNH.

**Further Material:** 2 ♀, 'Sarju Valley, Kumaon, 5000ft., India H. G. C.', '*Axonya championi* ANDR., H. E. Andrewes det.', 'H. G. Champion Coll., B. M. 1953-156', in BMNH;

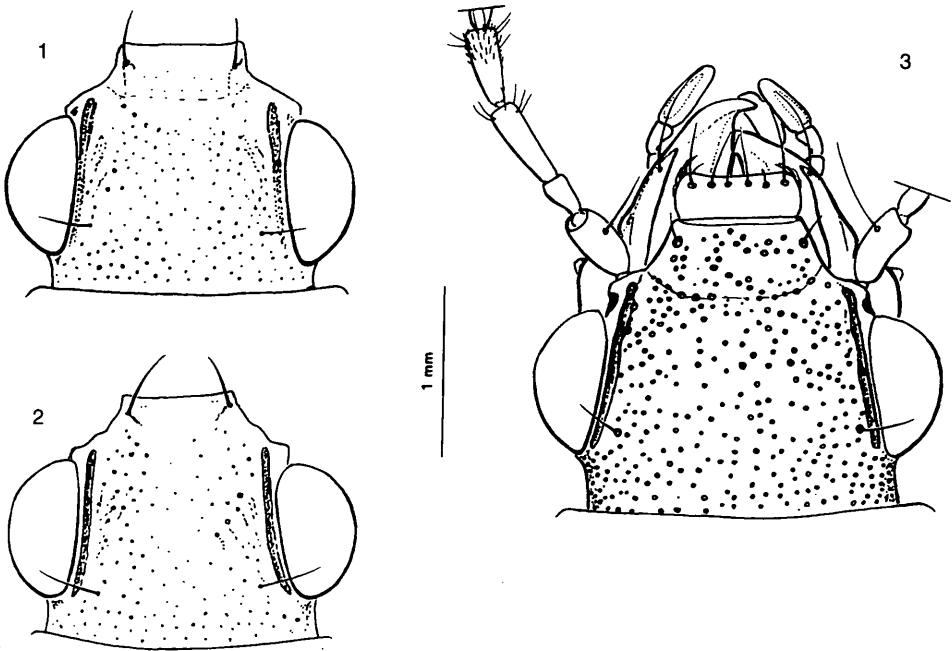
**Remark:** the first specimen lodged in the collection of *Axonya championi* ANDREWES, 1923 in BMNH bears the labels 'figured Specimen', 'Syntype' and '*Axonya Championi* ANDR. Cotype, H. E. Andrewes det.' and should be preferred as lectotype. Unfortunately, there is no locality indicated on this slightly damaged specimen, therefore we decided to designate another specimen (from W-Almora, Kumaon, Uttar Pradesh) as lectotype.

### *Axonya similis* spec. nov.

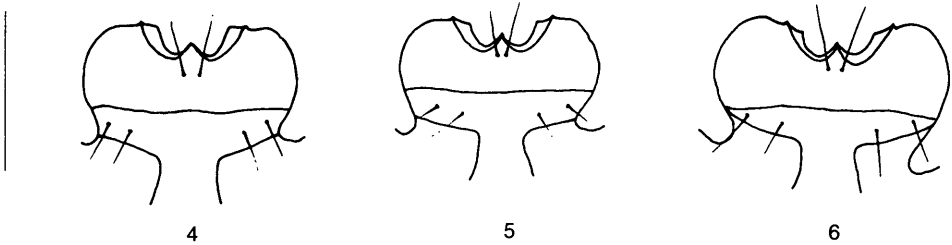
(Figs. 2, 5, 8, 11a-c, 14)

*Axonya championi* ANDREWES, 1923: ANDREWES 1926: 68 (partim); 1935: 42 (partim)

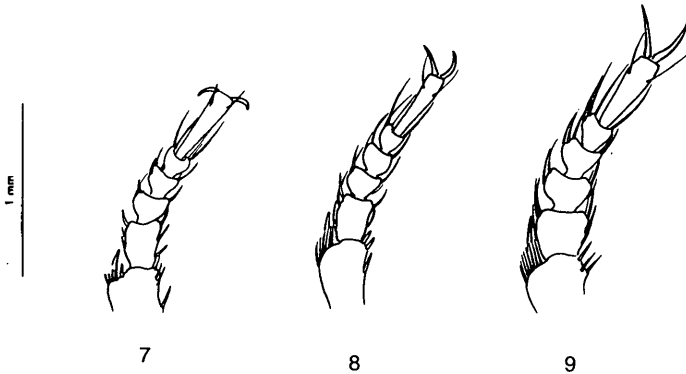
**Color and lustre:** dark green, tinged metallic green, especially on head, sides of pronotum and elytra and in elytral striae, but more reduced than in *championi*; surface shiny, head and pronotum without microsculpture, elytra with isodiametric microsculpture, antennomere 1 - 4



Figs. 1 – 3: Head, dorsal view of (1) *Axonya championi* ANDREWES, 1923, (2) *Axonya similis* nov. spec., (3) *Axonya farsica* nov. spec.



Figs. 4 – 6: Mentum, ventral view of (4) *Axonya championi* ANDREWES, 1923, (5) *Axonya similis* nov. spec., (6) *Axonya farsica* nov. spec. (Scale: 1mm).



Figs. 7 – 9: Right protarsi, dorsal view of (7) *Axonya championi* ANDREWES, 1923, (8) *Axonya similis* nov. spec., (9) *Axonya farsica* nov. spec.

reddish-yellow (3 and 4 darker at base), antennomere 5 - 11 fuscous, palpi and legs reddish-yellow; Labrum and mandibles reddish- to dark brown, ventral surface dark brown to piceous.

Head (Fig. 2): clypeus glabrous or with very few small punctures at sides only; supraorbital furrow along inner eye margin as deep and wide as in front of eye, and with vertical wall to inner eye margin; medial tooth of mentum more acute, slender, median tooth with two closely set basal setae; lobes of mentum continuously rounded at sides; distance of medial gular setae about 2.5 times distance of medial to lateral seta (Fig. 5).

Prothorax: very similar to *A. championi*, convex, about 0.9 times as wide as long, front angles distinct, not produced; sides rounded and constricted at base; posterior angles distinct but obtuse-angled; posterior margin medially slightly convex; median furrow very fine, not reaching anterior and posterior margin; anterior transverse furrow not visible; along margins coarsely punctate, disc more finely and sparsely punctate.

Elytra (Fig. 13): 1.6 – 1.7 times as long as wide, sides slightly convex, at shoulders broadly rounded; striae finely punctate-striate, also external ones, punctures in apical half of elytra smaller than in basal half; striae slightly deeper than in *A. championi*; intervals slightly convex; epipleura distinctly punctate along inner margin.

Ventral surface: head, proepipleura, meso- and metepisterna, sides of metasternum and of first two abdominal ventrites distinctly punctate; abdominal ventrites 3 - 6 with isodiametric microsculpture, finely punctate at sides.

Aedeagus (Fig. 11a-c): evenly curved in middle of length (Fig. 11a), apex of aedeagus narrowly rounded, subapically narrower than 0.3 mm; width of right paramere in apical third distinctly smaller than maximal width of left paramere (Figs. 11 b, c).

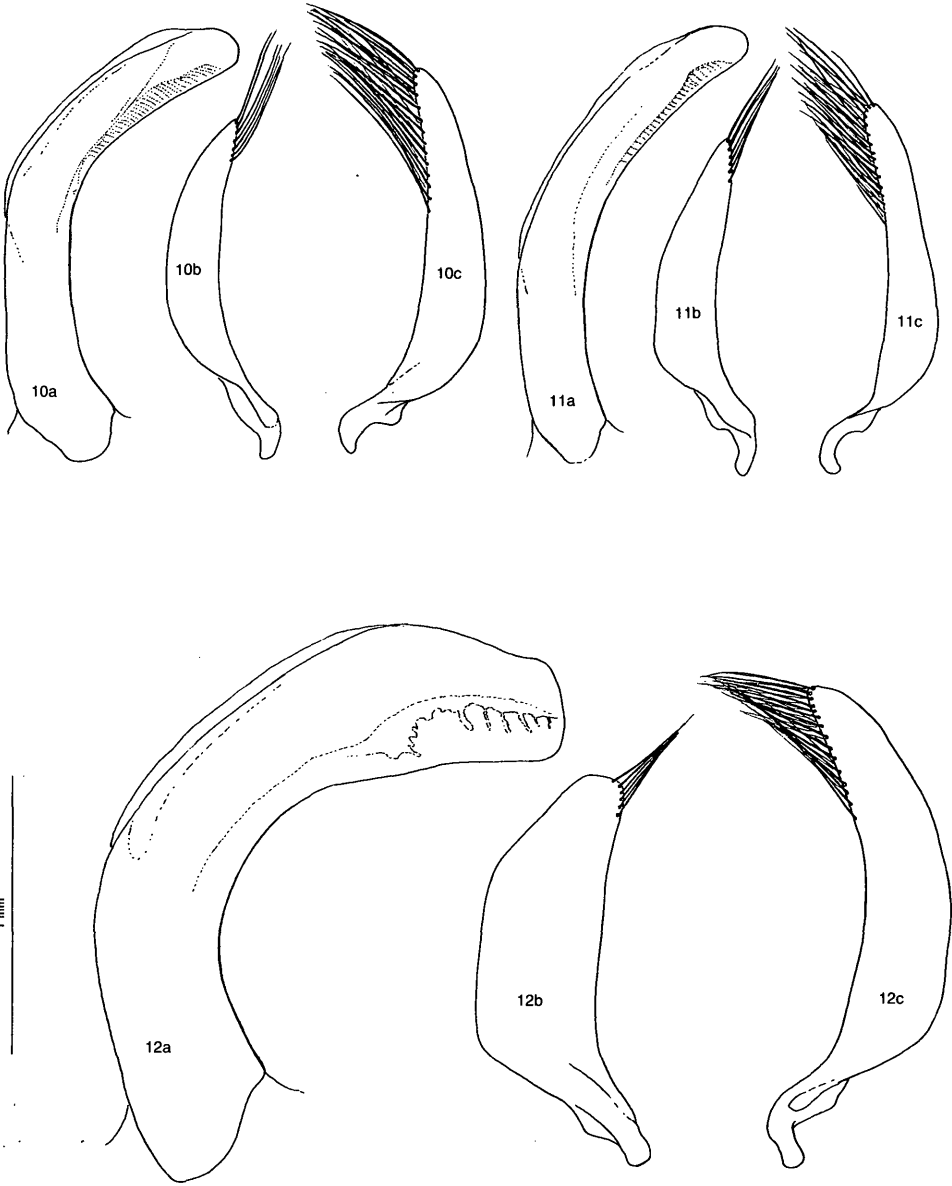
Legs: first three joints of protarsi weakly dilated in male (Fig. 8); mesotarsi not dilated in male, first 2 joints clothed beneath with very few, scaly hairs.

Measurements (Tab. 1): length 9.0 – 9.6 mm, width 3.2 – 3.5 mm.

Range: Nepal, Sikkim, Assam, Darjeeling.

Material examined: Holotype: 1 ♂, ,Nepal, Pokhara-See, 31.10.92, leg. J. Schmidt', *Axonya championi* ANDR. det. Kirschenhofer 94' in NHMW; Paratypes: 1 ♂, same data as Holotype, in CDV; 1 ♂, ,Darjeeling Distr., W-Bengal, Kulimpong, 20.4.84, leg. N. Bahadur', *Axonya championi* AND. Det. Morvan 1987', in NHMW; 1 ♀, ,Birik, Jisla Valley, Sikkim, 6.-9. X. 20, H. Stevens', ,Syntype', *Axonya Championi* ANDR. H. E. Andrewes det.', ,Paralectotypus *Axonya championi* ANDREWES, 1923, Dostal et Zettel det. 1999', in BMNH; 1 ♀, ,Ind. Mus., Assam-Bhutan Frontier, Mangaldai dist. N. E. 26.XII.10, S.W. Kemp., Ind. Museum Calcutta', *Axonya Championi* ANDR. Cotype, H. E. Andrewes det.', ,Syntype', ,H. E. Andrewes Coll. B.M. 1945-97', ,Paralectotypus *Axonya championi* ANDREWES, 1923, Dostal et Zettel det. 1999', in BMNH.

Comparative notes: *A. similis* is closely related to *A. championi* and distinguishable by the characters in the key. It is further distinguishable from *A. farsica* by the green colour and the punctate clypeus and epipleura of elytra.



Figs. 10 – 12: (a) aedeagus, left side, (b) left paramere, postero-internal view and (c) right paramere, postero-internal view of (10) *Axonya championi* ANDREWES, 1923, (11) *Axonya similis* nov. spec., (12) *Axonya farsica* nov. spec.

Tab. 1: Descriptive statistics of morphometry of *Axonya* species. Explanation of abbreviations: P-LW = Pronotum length:width; E-LW = Elytra length:width; L = Body length in millimeters, W = Body width in millimeters; SD = Standard deviation.

|                              |      | P-LW | E-LW | L (mm) | W (mm) |
|------------------------------|------|------|------|--------|--------|
| <i>A. championi</i> , n = 21 |      |      |      |        |        |
|                              | min  | 0.87 | 1.61 | 9.00   | 3.25   |
|                              | max  | 1.08 | 1.74 | 10.20  | 3.80   |
|                              | mean | 0.93 | 1.66 | 9.62   | 3.50   |
|                              | SD   | 0.04 | 0.04 | 0.44   | 0.17   |
| <i>A. similis</i> , n = 5    |      |      |      |        |        |
|                              | min  | 0.90 | 1.64 | 9.00   | 3.20   |
|                              | max  | 0.96 | 1.71 | 9.60   | 3.50   |
|                              | mean | 0.92 | 1.68 | 9.34   | 3.34   |
|                              | SD   | 0.02 | 0.03 | 0.23   | 0.11   |
| <i>A. farsica</i> , n = 1    |      |      |      |        |        |
|                              |      | 1.09 | 1.71 | 10.10  | 3.50   |

***Axonya farsica* spec. nov.**  
(Figs. 3, 6, 9, 12a-c, 15)

Color and lustre: bright metallic blue, head and pronotum tinged with metallic green lustre; base of elytra and first interval along suture piceous, without blue tinge; surface shiny, head and pronotum without microsculpture, elytra with isodiametric microsculpture, antennomeres 1 - 4 reddish-yellow (3 and 4 darker at basis), antennomeres 5 - 11 fuscous, palpi and legs reddish-yellow; labrum and mandibles reddish- to dark brown, ventral surface dark brown to piceous, ventrites reddish.

Head (Fig. 3): clypeus densely and coarsely punctate, similar to densely punctate middle part of head; supraorbital furrow along inner eye margin distinctly narrower and less deep than in front of eye; neck slightly constricted behind eyes, densely and coarsely punctate; lobes of mentum rounded at sides, median tooth with two closely set basal setae.

Prothorax: convex, 1.1 times as wide as long, front angles distinct, not produced; sides rounded and constricted at base; posterior angles distinct but obtuse-angled; posterior margin medially slightly convex; median furrow very fine, not reaching anterior and posterior margin; along margins coarsely punctate, disc more finely and sparsely punctate.

Elytra: 1,7 times as long as wide, sides slightly convex, at shoulders narrower than in *A. championi*; striae finely punctate-striate, also external ones; epipleura glabrous, without punctures, along inner margin with very few, small punctures only.





Figs. 13 – 15: Habitus, dorsal view of (13) *Axonya championi* ANDREWES, 1923, Lectotypus, ♂; (14) *Axonya similis* nov. spec., Holotypus ♂; (15) *Axonya farsica* nov. spec. Holotypus ♂.

Ventral surface: head, proepipleura, meso- and metepisterna, sides of metasternum and of first two abdominal ventrites distinctly punctate; abdominal ventrites 3 - 6 with isodiametric microsculpture, finely punctate at sides.

Aedeagus (Fig. 12 a - c): robust, in lateral aspect strongly rounded, apex truncate, subapically broader than 0.5 mm; left paramere extremely broad (Fig. 12b)

Legs: protarsi robust, first three joints strongly dilated (Fig. 9); mesotarsi not dilated in males, but the first 2 joints clothed beneath with scaly hairs.

Measurements (Tab. 1): Length 10.1 mm, width 3.5 mm

Material examined: Holotypus: 1 ♂ Iran, Fars, 76 km NW Shiraz, Sarbast, 2000m, 21.09. 1997, leg. H. Zettel (28), in CZV.

Habitat notes: the single specimen has been detected under a large stone at the bank of a small stream. The place has been shaded by a bridge.

Comparative notes: *A. farsica* is easily distinguishable from the other *Axonya* species by the bright blue color, punctate clypeus and unpunctured epipleura of elytra.

#### Acknowledgements

The authors are indebted to Martin Brendell (BMNH), Stuart J. Hine (BMNH) and Dr. Heinrich Schönmann (NHMW) for the possibility to study insect material under their care and for the donation of the paratype of *A. similis* (CDV); Dr. Adrian Stephen (Vienna) for reviewing the manuscript.

The second author cordially thanks Prof. Dr. Shidokht O. Hosseinie and Prof. Dr. Fara Hosseinie (both Shiraz University, Iran) for their kind invitation and their overwhelming hospitality, Mr. K. Elmi (Shiraz University) for his experienced assistance in field work and friendly guidance, and Stefan Schödl (NHMW) for the pleasant travel companionship in Fars, Iran.

## REFERENCES

- ANDREWES, H. E. 1923: Papers on Oriental Carabidae. – XII. The Annals and Magazine of Natural History, Ser. 9, 12: 679-681.
- ANDREWES, H. E. 1924: Mission dans les Provinces Centrales de l'Inde et dans la région occidentale de l'Himalaya, 1914, par Guy Babault, Carabidae: 22, pl.2: 5a, b.
- ANDREWES, H. E. 1926: On a collection of Carabidae from the Kumaon-Tibetan Frontier. - The Entomologist's Monthly Magazine 62: 65-80.
- ANDREWES, H. E. 1935: Carabidae Vol. II. Harpalinae I.; in.: The fauna of British India including Ceylon and Burma. Taylor & Francis, London: 1-323, pl. 1-4.
- CSIKI, Ernő, 1927: Carabidae: Carabinae: Mormolycinae, Harpalinae. III. Trib. Broscini. In: JUNK, W., SCHENKLING, S.: Coleopterorum Catalogus; W. Junk, Berlin, 97: 8-27.
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Jahr/Year: 1999

Band/Volume: [51](#)

Autor(en)/Author(s): Dostal Alexander, Zettel Herbert

Artikel/Article: [Revision of the genus \*Axonya\* Andrewes, 1923 \(Coleoptera: Carabidae\). 109-118](#)