

First Record of Genus *Curteria* (Actinedida: Erythraeidae) From the Caucasus

Received: 11 February 2023, **Revised:** 13 March 2023, **Accepted:** 18 April 2023

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Keywords:

Caucasian fauna, Actinedida, Azerbaijan, genus, *Curteria*, mites.

Abstract

In the article, there is given information on description, spread, the structure of *Curteria* Southcott, 1961 species and *Curteria* *episcopalis* (C.L.Koch, 1837) species which are new for the Caucasus. *Curteria* genus is one of the 25 species of the sub-family Erythraeinae. Unlike the erythraeus genus, *Curteria* does not have cone-shaped setae (canales) on pedipalps. And unlike the *Eatoniana* genus, *Curteria* is deprived of the setae made of extended setae in the 4th pairs of legs. The genus of *Curtria* Southcott, 1961 cinsi and the species of *Curteria* *episcopalis* (C.L.Koch) are new for Caucasian fauna. 3 adult individuals and 1 larva of *Curteria* *episcopalis* (C.L.Koch, 1837) species were discovered in the Azerbaijani part of the Caucasus. In 2018, 1 larva was observed in Qakh region, Azerbaijan. In this article, it is given information that *Curteria* *episcopalis* species is new for the Caucasian fauna. This species is only in sandy places and the broad-leaved forests.

Introduction.

Purpose. The purpose of this study is to provide detailed information about the species of *Curteria* *episcopalis* firstly recorded in the Greater Caucasus natural region of Azerbaijan. **Methods.** The article presents the research data about the distribution of *Curteria* *episcopalis* species of *Curteria* genus in Azerbaijan and gives its morphological description. The materials have been collected from plants, soil under the stones, the highland-broad-leaved forests, sandy places and fruit-gardens (in 2017-2019 years, in the districts of Greater Caucasus such as Zagatala, Gakh, Shaki, Gabala, Ismayilli, Shamakhi, Gobustan, Khizi, Siyazan, Shabran, Guba, Gusar, Khachmaz and in Absheron peninsula) and brought to the laboratory for review.

Results. Our studies show that the range of the species of *Curteria* *episcopalis* is splitted up in Azerbaijan. Individuals of this species have been found at the distant points from each other (Talish Mountains - Zuvand, Absheron Peninsula and lowland-broad-leaved forests of the Greater Caucasus). Representatives of this species are found in the sands on the one hand, and in the lowland-broad-leaved forests on the other hand. But in Talish Mountains, this species was found in fruit orchards. It is a rare species. They are usually found one by one.

Conclusion. The larvae of *Curteria* *episcopalis* species were firstly collected in the Caucasus, in 2018. The collection place and time of species were noted and the drugs were prepared. The species were applied and the pictures were taken.

1. Introduction:

One of the new species of Erythraeidae genus for Caucasian fauna is *Curteria* Southcott 1961 species. 7 types of this species are known in the world: *Curteria* *curticristata* (Wilmann, 1951), *Curteria* *duzgunesae* (Saboori, Chobanoghlu, and Bayram, 2007), *Curteria* *episcopalis* (C.L.Koch, 1837), *Curteria* *Ernest* Haitlinger, 2004, *Curteria* *graeca* (Beron, 1988), *Curteria* *southcotti* Gabrys, 1992, *Curteria* *fagali* (Cooreman, 1956) Çobanoğlu et Bayram 2007 noted the synonym of Saboori and Çobanoğlu (2007) species named *Zhangiella* Saboori [3]. *Moriera* *curticristata* is the exemplary species of Wilmann, 1951. In the article, there is given information on description, spread, the structure of *Curteria* Southcott, 1961 species and

Curteria *episcopalis* (C.L.Koch, 1837) species which are new for the Caucasus.

2. Material and Methods

This material was collected in 2017-2019 years, in the districts of Greater Caucasus such as Zagatala, Gakh, Shaki, Gabala, Ismayilli, Shamakhi, Gobustan, Khizi, Siyazan, Shabran, Guba, Gusar, Khachmaz and in Absheron peninsula. During this time, tea plantations, orchards, vineyards, artificial forest areas, arid thin forests, grunts, forest-wastelands, meadow-wastelands, tomillares, different types of forests such as plain forests, pine forests, riparian forests, highland-broad-leaved and small-leaved forests, including river bank forests, forests of mountain river terraces and valleys,

subalpine meadows, deserts, semi-deserts, ephemerides, sands, solonchak, wetlands, thorny herbs, harbor lakes, mud volcanoes were investigated. Over 2,500 specimens of herbs, hemispheres, shrubs, trees, mosses, molluscs, wrinkles, stones, fungus, soil, flooring, woodwork, as well as vertebrates (insects and spiders) were examined. During the experiment, more than 200 individuals of erythroid mites were collected and more than 100 drugs were prepared. In addition, the collection of mites stored in the laboratory of "Dry Invertebrates" of the Institute of Zoology of ANAS was also investigated and the results of the research were compared.

The material has been collected from plants, soil, under the stones in the mountainous-broad-leaved forests, sandy places, and fruit-gardens. The collected material has been brought to the Laboratory of Azerbaijan National Academy of Sciences. Also, the collection materials of the laboratory are reviewed. The drugs have been made from the gathered materials and dried at 56°C of thermostat in 14-20 days. The drugs prepared for the determination of species are defined using specific prescription tables. The prescription of the drugs has been carried out by appropriate prescription tables under the microscopes named MBI-3, Olympus CX-41, MBI-15U4.2. The phase contrast, oil or water immersion is used during the work of MBI-3 and MBI-15U4.2. The pictures were taken by RA-6 camera or digital camera. The mites were measured by ocular-micrometer.

3. Results

Taxonomy

Curteria Southcott, 1961

Syn. Zhangiella Saboori, Çobanoğlu et Bayram, 2007

Description. There is a pair of an eye at the level of back part of the forehead line in deutonymph and adult individuals. The forehead line exists, but the tendency of the anterior sensual area to the reduction is observed (border between anterior sensual area and shield). Dorsal idiosomal and foot setae are usually simple and needle-shaped. There are no saw-tooth setae (serrate) in the feet. Pedipalps are deprived of specialized cone-shaped setae (canales). There are 2 pairs of receptacle seminales in females [1, 5].

Larva. The shield is solid rectangular and is applied with two pairs of trichobothria and two pairs of normal setae. There are one pair of eyes in each part of the shield. There are 2 setae in the hip of the pedipalp. The legs are comparatively short. The anterior solenoid of calf of leg I is observed with other setae (xetopara). The pelvises of leg II are supplied with 4 setae, and there are 3 pairs of setae in the pelvises of leg III. The twist setae formula is 4-4-3. The anterior of paws of leg I-III are supplied with medial like-hook empodia and lateral claws deprived of terminal claw and differed from each-other [6].

Curteria Southcott, 1961 species are new for the Caucasian fauna.

Spread: Europe, Southern Caucasus (Azerbaijan), Asia (Iran), Northern Africa (Azor and Kanar islands) [3, 6].

Curteria episcopalis (C.L.Koch, 1837)

Material: 1 adult individual was collected in Absheron peninsula, Anjirlik, sandy places, on 27 May, 1984 (collected by: Kh.Aliyev); Khizi region, Bakhishli village, low-mountainous oak forest (including Georgian oak), plants, 1 adult individual, on 1 July, 2018; Qakh region, Qashqachay village, medium mountainous hawthorn-peanut forest, plants, 1 larva, on 30 July, 2018 were collected. Also, 1 adult individual was found under the stones in the fruit gardens, in the Qosmalian village, Lerik region, Azerbaijan on 28 June, 1985 (collected by: Kh.Aliyev).

Description. The size of teeth is medium, body is oval-shaped, "shoulders are unclear," the color of live mites is metallic green. Pedipalps are solid and are covered with smooth and long setae, palpgenu (knee of pedipalp) has specific crescent-shaped cavity in the proximal ventral part. The claw of the calf of pedipalp is supplied with little tooth in the ventral part (near the membrane). The forehead line situates comparatively in a short and narrow shield. A distal part of the shield forms the wedge-shaped ledge in the back part of posterior sensual area. The anterior sensual area is circled, sclerotized poorly and enters relatively into a shield. AL non-sensual setae are long, solid and poor setula-bearing, their number is less than 10. AS (anterior) and PS (posterior) sensillars are long, shorter and poor setula-bearing. Anterior sensillars are always shorter than posterior sensillars. There are 2 eyes in each posterior part of the forehead line (Fig. 1).



Figure 1. Adult individual, gnathosoma: forehead line and eyes

orsal setae are same-shaped, but their thickness and length are various. They are severe, solid, tender needle-shaped, and they shrink towards the tip and almost are sharp-pointed. They are smooth in the proximal part; they are more cogged in the distal part and almost are covered with adhesive setullars. Ventral setae are similar to dorsal setae, but in comparison, ventral setae are excessively thin, needle-shaped and shorter. The long setae prevail in the posterior part of opisthosoma (both dorsal and ventral setae). Legs are relatively short; leg I and IV are at the same length and are longer than leg II-III. All the legs are covered with same-shaped, needle-shaped scopes. The paws are thin and long. The paws of leg I are supplied with cone-shaped famulus (7 m.km) in the dorsal-distal part. Vestigial organs are poorly-enlarged in the middle

section, are shovel-shaped and they situate separately in the dorsal-distal parts of calves (9 m.km) and knees (9 m.km) of leg I, also knees of leg II (8 m.km).

Male. The body of male is in the same shape and size. It has a solid sclerotized penis (genital sclera). It differs slightly for its body sizes and the view of external genitalia [1, 2].

Larva. The length of newly-hatched larvae is 400-500 m.km, and the width is 200-255 m.km. The color of live mites is orange (Fig. 2).

Gnathosom. There is membrane (85-104 m.km) and dactyls supplied with distal hook (chelicera knife) in Chelicera (Fig. 3).



Figure 2. Common view of larva

Gnathosom is supplied with 1 pair of capillary adoral setae which has dorsal section in front (cs) (21-35

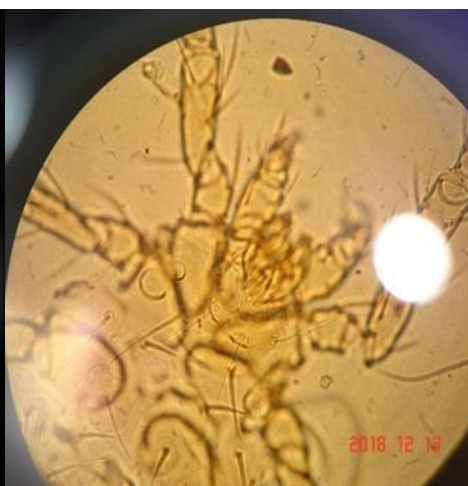


Figure 3. Larva, propodosoma and gnathosom

m.km) and 1 pair of mace-shaped supra-coxal setae placed in lateral section (elcp) (4-6 m.km).

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There are 1 pair of smooth sub-capitulary (tritorstral) setae (bs) (29-34 m. km) and 1 pair of needle-shaped oral setae (as) (3-5 m.km) in the ventral part of gnathosom. The hip of pedipalp has 2 and its knee has 1 setula-bearing setae. The calf of pedipalp is supplied with 3 smooth setae. Odontus (claw of pedipalp) is split up. The paw of pedipalp is supplied with plain distal euphatids that create pairs with 5 normal, almost smooth setae, 1 solenoid, and 1 little seta. Shield has solid rectangular size. It consists of 2 pairs of poorly setula-bearing sensillars and 2 pairs of prickly setae. 1 pair of eyes situated in general ocular sclerite, at the level of posterior shield. The rest of idiosoma is smooth and is covered with cuticula in the starched wrinkles. Dorsal setae (37-60 m.km) gather in starched lines and place in shields. The number of setae in lines is various, for example, C line is supplied with 6-8 setae. A total number (except for setae in a shield, pelvis, and between pelvises) of dorsal and ventral setae of idiosoma changes from 46 to 58.

Legs. The segmentation formula of legs is 7-7-7. Normal setae placed in legs are smooth or especially ventral setae are supplied with setullars. The formula of twisted setae is 4-4-3. Medial empodia of anterior paws of legs I-III is arc-shaped and is supplied with small thorns. Lateral (side) claws are deprived of terminal claw but are supplied with several branched setullars (alloform, is wing-shaped) [4, 6].

Curteria episcopalis species are new for the Caucasian fauna.

Spread: Central (Germany, Nederland and Poland) and Northern (Sweden and Finland) Europe; Southern Caucasus: Azerbaijan; Asia: Iran [1, 3, 6].

Biology and life-cycle: the larvae parasitize in trips (in nymphs and adult individuals) and they are seen in the soil [3, 6].

4. Conclusion

Curteria species and type were firstly found in the Caucasian region in 1984. The larvae of *Curteria episcopalis* species were firstly collected in the

Caucasus, in 2018. The collection place and time of species were noted and the drugs were prepared. The species were applied and the pictures were taken. Our studies show that the range of the species of *Curteria episcopalis* is splitted up in Azerbaijan. Individuals of this species have been found at the distant points from each other (Talish Mountains - Zuvand, Absheron Peninsula and lowland-broad-leaved forests of the Greater Caucasus). Representatives of this species are found in the sands on the one hand, and in the lowland-broad-leaved forests on the other hand. But in Talish Mountains, this species was found in fruit orchards. It is a rare species. They are usually found one by one.

References

- [1] Gabrys, G. (1992). *Curteria southcotti* sp.n. from Poland with redescription of *C.episcopalis* (C.L.Koch, 1837) comb. Nov (Acari: Actinedida: Erythraeidae). *Genus (Wroclaw)*, 3 (4), 243-259.
- [2] Gabrys, G. (2016c). A key to postlarval Erythraeidae (Acari, Actinotrichida) of Poland. *Annals of the Upper Silesian Museum (Bytom). Natural History, [Rocznik Museum Gornoslaskiego w Bytomiu Przyroda]*, 22, 1-22.
- [3] Jamshidian, M.K., Noei, J., Reza, A.M. (2014) First record of the genus *Curteria* (Acari: Erythraeidae) from Iran. *Persian Journal of Acarology*, 3 (1), 103-106.
- [4] Noei, J. (2017). A new genus and species of larval Erythraeinae (Acari: Erythraeidae) ectoparasitic on Collembola from Iran. *Systematic and Applied Acarology* 22 (8), 1257-1266.
- [5] Witte, H. (1995). Evolution and phylogenetic system of the Erythraeidea (Prostigmata. Parasitengonae). In: Kropczynska D., J. Boczek and A. Tomczyk, Eds. *The Acari: physiological and ecological Aspects of Acari. Host relationships*. Dabor, Warszawa, 117-148.
- [6] Wohltmann, A., Witte, H., Olomski, R. (1995). Organismal pattern causing high potential for adaptive radiation in Parasitengonae (Acari: Prostigmata). *Proceeding of the 10th international congress of Acarology*. Melbourn, 83-99.