Turk J Zool
31 (2007) 213-217

Otiorynchus lederi Stierlin (Coleoptera: Curculionidae): A New Record and a New Pest in Turkey

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Received: 05.10.2005

Abstract: *Otiorhynchus lederi* Stierlin, 1876 (Coleoptera: Curculionidae) was detected in northeastern Anatolia. This species has been known as a parthenogenetic form so far. We found in Transcaucasus and Turkey several bisexual populations of this species for the first time and we redescribed them. *O. lederi* is allied to *Otiorhynchus erivanensis* Reitter, which was described from Armenia. Diagnostic features separating these 2 species were indicated. Both of these species are new records for the Turkish fauna. Although *O. lederi* is a polyphagous it is a pest of currant (*Ribes* spp.), rose (*Rosa* spp.), and strawberry (*Fragaria* spp.) species in Erzurum province, especially in the land around Atatürk University. The weevils feed in a typical way, whereby they chew irregular-shaped areas from the margins of the leaves, and sometimes defoliate small plants. It is univoltine and hibernates as an adult among the roots of grasses under currant and rose species or other host plants. *O. erivanensis* is a rare species; only 2 females have been found.

Key Words: *Otiorhynchus lederi,* redescription, currant, new pest, new record, Turkey

Otiorynchus lederi Stierlin (Coleoptera: Curculionidae) Türkiye Faunası İçin Yeni Tür ve Yeni Bir Zararlı

Özet: Kezey Doğu Anadolu'dan saptanan *Otiorhynchus lederi* Stierlin, 1876 (Coleoptera: Curculionidae) türünün şimdiye kadar sadece partenogenetik formu bilinirken, Transkafkasya ve Türkiye'de değişik yerlerde biseksüel formları da bulunmuş ve *O. lederi*'nin tanımı yeniden yapılmıştır. *O. lederi* Ermenistan'dan tanımlanan *Otiorhynchus erivanensis* Reitter'e çok benzemektedir. Her iki tür de Türkiye faunası için yeni kayıtlar olup ayırt edici özelliklerine de değinilmiştir. *O. lederi* polifak bir tür olmakla beraber firenk üzümü (*Ribes* spp.), kuşburnu (*Rosa* spp.) ve çilek (*Fragaria* spp.) türlerindeki zararı önem taşımaktadır. Yaprakların kenarlarında beslenerek yaprağın düzensiz tırtıklı bir görünüm almasına neden olmakta, ileri durumda sadece damarlar kalmaktadır. Özellikle Atatürk Üniversitesi arazisinde ciddi zararlara neden olduğu gözlenmiştir. *O. lederi,* yılda bir döl vermekte ve kışı ergin dönemde firenk üzümü, kuşburnu veya diğer konukçu bitkilerin altında veya yakınında toprak içerisinde geçirmektedir. *O. erivanensis* nadir rastlanan bir tür olup sadece iki dişi birey bulunabilmiştir.

Anahtar Sözcükler: *Otiorhynchus lederi,* yeniden tanımlama, firenk üzümü, yeni kayıt, yeni pest, Türkiye

Introduction

Curculionidae is currently the largest family of animals in the world with at least 3600 genera and approximately 41,000 species (Booth et al., 1990). Otiorhyncinae is one of the largest subfamilies of Curculionidae, occurring throughout the world. *Otiorhynchus* Germar, is a palaearctic genus with numerous economically important species (Reitter, 1914; Ter-Minassian, 1946; Arnoldi et al., 1965; Booth et al., 1990). About 1500 species are known and a few species were introduced into North America (Magnano, 2001).

Since the beginning of the 1990s we have occasionally observed insect damage on the leaves of some plant species, particularly on currant (*Ribes* spp.) and rose (*Rosa* spp.) species, on the land around Atatürk University, Erzurum, Turkey. However, in the last few years an outbreak occurred and seriously damage has been observed on the leaves of current, rose, and

strawberry. This insect species is identified as *Otiorhynchus* (*Proremus* Reitter) *lederi* Stierlin, 1876 (Coleoptera: Curculionidae). *O. lederi* was described by Stierlin from the Caucasus on the series of females (Stierlin, 1876) and was known only as parthenogenetic before our investigation. The aim of this paper is to give available information about *O. lederi*, which is very abundant on the land around Atatürk University and caused damage to some plant species.

Materials and Methods

This study was carried out in northeastern Anatolia. Biological observations were performed on the land around Atatürk University in Erzurum at an altitude of 1850 m during 2002-2004.

Approximately 150 specimens of *O. lederi* from collections of the Zoological Institute in St. Petersburg (Russia) and northeastern Anatolia, several 100 specimens on the land around the university and some other localities were examined. The weevils were collected by insect net at night. *O. lederi* was redescribed and original drawings were prepared.

Results

Redescription of *Otiorhynchus lederi*

Female: Rostrum 0.68-0.72 times as long as wide, moderately narrowing to pterygia and forming weak cone with head capsule, the narrowest part of rostrum near the base of pterygia, maximum width of rostrum 1.26 times its minimum width. Rostral dorsum weakly concave and with thin medium carina and is longitudinally rugose. Frons shallowly depressed. Epistoma wide arcuated, epistomal angle not protruding beyond head outline. Eye oval, 1.27 times as wide as long, and moderately convex; anteroventral edge of eye not attenuate obliquely to ventral side and not prolonged, has no sulcus on the underside of the rostrum. Temple convex; behind eyes with gradually smaller punctation towards the back, each punctation with hair in the center. Surface of the basal part of head completely covered with micropunctation inside both punctation and interspace (Figure 1a).

Antennae moderately thin, scape gradually widening from base to tip and near apical part abruptly enlarging. First segment of funicle 1.40 times narrower than the apical part of scape, slightly asymmetrical, 2.20 times as long as wide, second segment has equal length with the first one or slightly longer and 1.70 times as long as third segment, segments 3-7 sub-equal size. Club elongate, 1.60 times as wide as last segment of funicle and slightly longer than funicle segments 5-7 combined (Figure 1b).

Pronotum 1.10-1.20 times as wide as long, moderately narrowing basally and apically. Widest part of pronotum slightly behind the middle. Disk covered with distinctly pupillate granules; 11-12 granules are seen along the length of disc. Granules and intervals between them shiny, intervals very narrow (Figure 1a).

Elytra oval, 1.40 times as long as wide, sub-parallel sides. Intervals uniformly narrow and flattened, slightly wider than stria or the same. Stria composed of wide, more or less rounded, very weakly shallow punctures; punctures in stria usually not merged with each other. Stria constitute weak furrow in preapical part (Figure 1a).

Apical margin of tergit 7 of female slightly sinuated. Ventrites 1 and 2 flattened; anal ventrite depressed in preapical part.

Femora with spinous tooth; fore femur distinctly wider than middle and hind tooth on fore femur slightly bigger than others. Outer margin of fore tibia straight, inner margin weakly "S" form; apical part widened with outside rectangular angle; inner margin of apical half with 4-5 small denticles (Figure 1c). Apical comb with densely short spines. Spines on apical comb of middle and hind tibiae approximately 2 times as long as fore tibia comb spines. Tarsi moderately wide; segment 1 oblong, about 1.20 times as long as wide; segment 2 more or less triangular, as long as wide or slightly elongated, slightly shorter than bilobed segment 3; protruding part of claw segment slightly longer than segment 3 (Figure 1d).

Vestiture. Body brown, moderately shiny. Vestiture composed of sword-shaped semi-erect reclinate setae on dorsal body surface and oval or more or less rounded scales; scaling not contiguous. Lateral sides of head under the line between eyes and pterygia with hairs or narrow flattened scales. Setae on pronotum located on granules, intervals between granules bare. Some of granules on the lateral sides of pronotum have scales; scales on elytra concentrated at intervals, but irregular; also it can occur on stria. Setae on elytra constitute 1 or 2 irregular rows

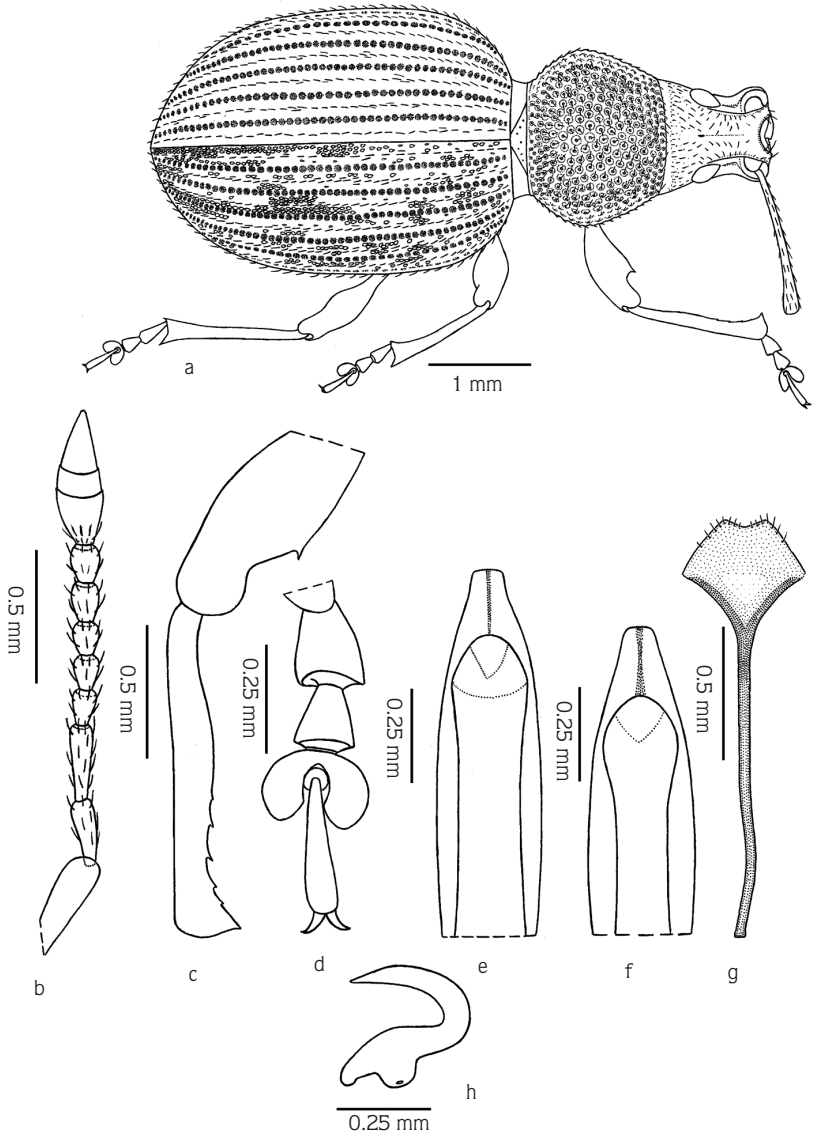

Figure 1. *Otiorhynchus lederi* Stierlin a: female; b: antenna; c: fore right leg, ♀; d: fore right tarsus, ♀; e, f: apical part of aedeagus; g: spiculum ventrale; h: spermatheca.

on intervals; each strial puncture with 1 short setae as well. Antenna, legs, and ventrites with semi-erect filiform setae.

Body length 4.50-6.10 mm, width 1.95-2.90 mm.

Male: Morphologically male is similar to female, except genital organ: Aedeagus narrowing apically from prepucial part and blunted at tip. Penis 4.10-4.70 times as wide as long, moderately curved dorsoventrally, usually shorter than apophysis. Walls of endophallus in basal part of penis densely covered with minute sclerites (Figure 1e, f). Lamella of spiculum ventrale as long as wide. Apical margin of lamella distinctly sinuated (Figure 1g). Spermatheca with large ramus, which is wider than collum (Figure 1h). Coxite of ovipositors weak sclerotized with distinct short stylus.

Body length 4.20-5.40 mm, width 1.85-2.60 mm.

Comparative notes

Otiorhynchus lederi is closely related to *O. erivanensis* Reitter, differing from it in the larger size of body, elongated funicle of antennae, more transverse pronotum, and presence of a distinct tooth on the femur. The male differs in its wider femur and wider ventrites.

Material examined

Artvin, 6 km E Yaylalar, Barutdağı, 40°51'29"N/41°20'35"E to 40°49'70"N/41°21'84"E, 1970 m, 6.VI 2003 (G. Davidian leg.), 6 ♀♀; Şavşat, Karagöl, 1700 m, 8.VII 1998 (L. Gültekin leg.), 4 ♀♀, on *Fragaria* sp.; Ardahan, Yalnızçam, ENE Ardanuç, Çadır Dağ, 41°07'26"N/42°14' 26"E, 2900 m, 19.VII 2003 (G. Davidian leg.), 2 ♂♂, 15 ♀♀; Trabzon: S of Trabzon, sources of Altındere, 2200-2500 m, 2.VI 1996 (G. Davidian leg.), 1 ♀; Gümüşhane, S slope, Zulfe Dağı, 2000-2700 m, 9.VI 1996 (G. Davidian leg.), 1 ♀; Gümüşhane, basin of Soiran River, 1500-1800 m, 5-6.VI 1996 (G. Davidian leg.) 30 ♀♀; Bayburt, 31 km S of Bayburt, Kopdağı, 1800 m, 21.VI 2001 (L. Gültekin leg.) 2 ♀♀; Kopdağı, 1750 m, 27.VI 2002 (L. Gültekin leg.) 1 ♀; Çalıdere, 1750 m, 16.VI 2000 (L. Gültekin leg.), 1 ♀, *Salix* sp. bushes habitat; Kopdağı Pass, 2400 m, 21.VI 2003 (L. Gültekin leg.) 2 ♀♀, in soil in vicinity of the root crown of *Erysimum pulchellum*; Kars, Sarıkamış, 15.VII 1913, 1 ♀; Erzincan, S Erzincan, Akbaba Mt., 2600 m, 21.VI 1998 (G. Davidian), 1 ♀; Mercan, Yaylabaşı, 1800 m, 20.VI 1998 (G. Davidian leg.), 2 ♀♀; Erzurum, Aşkale, Tepebaşı, 1900 m, 6.VI 1998 (L. Gültekin leg.), 2 ♀♀, *Quercus* forest habitat; Erzurum, 30 km N, 1900 m, 14.VI 2003 (L. Gültekin leg.), 2 ♀♀, under *Salix* sp. bushes; Mescit Dağları NE slopes, 25 km NW Şenyurt, 2000 m, 18.VI 1998 (B. Kataev and A. Solodovnikov leg.) 20 ♀♀; Pasinler, Rabat, 2200 m, 14.VII 1998 (L. Gültekin leg.), 1 ♂, *Populus tremula* forest habitat; Atatürk University Campus, 1850 m, 16.V 2001, 20.VI 2001, 04.VI 2003 (H. Özbek leg.), 85 ♀♀, on *Ribes* species; 28 km S of Çat, Çirişli Geçidi, 2100 m, 8.VI 2003 (L. Gültekin leg.), 1 ♀.

Distribution

Inhabits Crimea and most parts of the Caucasus including Talysh Territory and northeastern Turkey. Area of *O. lederi* in Anatolia is limited by Sakaltutan Pass near Refahiye (Erzincan) in the west, Ağrı in the east, the Black Sea in the north, and Harhal Mountain in the south. We have 2 specimens (♀♀) from Sarıkamış (Kars), which were determined as *O. erivanensis*. Both *O. lederi* and *O. erivanensis* are new records for the Turkish fauna.

Biological observations and damage

The hibernating weevils feed on the leaves of currant species (*Ribes petraeum* Wulfen, *R. rubrum* L.), rose (*Rosa* spp.), strawberry (*Fragaria* spp.), and other host plants. The first signs of activity manifested by this weevil on the leaves of its food plants in the spring was observed in May (on May 15-20, 2002 and 2003; May 5-7, 2004), about the time that flower buds of *R. petraeum* had just started to open on the land around Atatürk University. Feeding continued almost until the end of August. At the beginning of September new generation adults emerged and fed during September and the first week of October, and then went into the soil or under the stones among the roots of grasses under host plants for hibernation. We found hibernating weevils about the root crown of *Festuca ovina* L. and other Gramineae plants under currant species in April 2002.

O. lederi has a nocturnal habit, feeds at night, and remains on the ground in the day time. The weevils are leaf-edge feeders and feed in a typical way, whereby they chew irregular-shaped areas from the margins of the leaves. The uneaten portions of the leaves at the margins turn brownish and dry up. Sometimes the weevils completely defoliate, especially the small plants, or leave only the ribs of the leaves. We observed that, as a result of the damage caused by the weevil to the leaves, the bushes failed to have a sufficient number of functional leaves in the season and dried up in following years. During the day adults usually go into hiding under litter and at night time weevils climb up the stem to the leaves to eat. The female presumably puts its eggs in the soil and the larvae live in the surface level of the soil near the roots of different plants. Larvae and adults of *O. lederi* have different species of host plants. It is monovoltine. However, in high mountain regions development of the generation continues for more than a year.

Besides the current, rose, and strawberry species, we observed that *O. lederi* feeds on *Betulae* sp., *Laurocerasus* sp., *Malus* spp., *Pirus* spp., *Prunus* spp., and interestingly on *Populus* spp., and *Salix* spp., and even on *Juniperus*

sp. Although it is a serious pest on current, rose, and strawberry, in trees feeding occurred only on the leaves of the shoots at the base of the plants. In the upper parts of trees feeding has not been observed, except in small trees.

The genus *Ribes* comprises several species and varieties of bushes occurring in Turkey (Davis, 1997). Of these, *R. petraeum* and *R. rubrum*, particularly the former, are abundantly present on the campus of Atatürk University and in the parks of the city of Erzurum as ornamental and fence bushes. It should be emphasized that *O. lederi* threatens these plant species on the campus. On the other hand, cultivations of currant and strawberry have been increasing in Erzurum province in recent years. *O. lederi* is a potential pest on this plant species in this area. While *Otiorrhynchus meridionalis* Gryll. is a pest on strawberry, *O. sulcatus* (Fabricus) is a pest on black vine (Audemard et al., 1981; Masaki and Sugimoto, 1991).

Discussion

Herein, we present the redescription of *O. lederi* and give data on damage to some host plants in Turkey for the first time. It is a mesophillous species found in habitats with bushes and forest. As with most of the other species of the genus *Otiorhynchu*s (Di Marco and Osella, 2001), it is polyphagous.

This study reveals that there are 2 morphological forms of *O. lederi*: parthenogenetic and bisexual. The parthenogenetic form inhabits most of the area and is distributed in habitats with bushes usually not more than 2000 m above sea level. We have found in Transcaucasus and Turkey several bisexual populations of *O. lederi* for the first time. They are known from small territories in alpine zones isolated from each other: in Georgia (env. of Bakuriani), in Armenia (Dzhavakhet Mt.R), and in Turkey (Yalnızçam Mt.R, Ardanuç, Artvin; Rabat, Pasinler, Erzurum).

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