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NATURAL HISTORY OBSERVATIONS ON SPECIES OF THE TIGER BEETLE GENUS *OXYGONIA* IN ECUADOR (COLEOPTERA: CICINDELIDAE)

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ABSTRACT

The natural history and habitats for nine species of the Neotropical tiger beetle genus *Oxygonia* are reported from Ecuador. The members of this genus all occur on rocks in the current and vegetation along the margins of fast-flowing mountain streams. Most species are diurnal, but two or perhaps three species are primarily nocturnal.

RESUMEN

Se informa de la historia natural y de los habitats de nueve especies de escarabajos tigre de género neotropical *Oxygonia* en Ecuador. Todos los miembros de este género se encuentran en los ríos montañosos en las piedras de la corriente y en el sotobosque de la ribera. La mayoría de las especies son diurnas, pero dos o posiblemente tres especies son principalmente nocturnas.

INTRODUCTION

Specimens of the genus *Oxygonia* are uncommon in collections, and little has been published about their natural history (Bates 1872, Lawton 1972). Largely due to the extreme sexual dimorphism in color, the taxonomy is uncertain and often confused (Horn 1926). The seventeen recognized species (Wiesner 1992) in this genus occur in mountainous areas from Costa Rica and Panamá along the Andes Mountains to central Bolivia.

Eleven of these species are found in Ecuador (Nuñez et al. 1995), and it is apparently the center of their distribution. While conducting a

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survey of the tiger beetles of Ecuador in conjunction with Ecuadorian colleagues at the Pontífica Universidad Católica del Ecuador in Quito, the Museum of Natural History, Quito, and the Universidad de Guayaquil, Guayaquil, we have collected nine species of *Oxygonia*. The goal of this paper is to report specific habitats and natural history observations for these species.

SPECIES ACCOUNTS

***Oxygonia carissima* Bates**. We found this species regularly but nowhere common on small rushing streams above 1,200 m on the eastern slope of the Andes Mountains in southern Ecuador. It is primarily diurnal and forages on rocks and boulders in the middle of shallow, white water streams 2-20 m in width. At night it generally roosts on leaves of overhanging bushes and trees 2-5 m above the stream surface. Occasionally we found individuals roosting on rock surfaces at night. Other tiger beetle species found at the same sites were *Oxygonia floridula* Bates, *O. vuillefroyi* Chaudoir, *O. uniformis* W. Horn, *O. moronensis* Bates, and three species of *Oxycheila*.. At no single site, however, did we find more than three species of *Oxygonia* together, and *O. carissima* was always the least common.

***Oxygonia vuillefroyi* Chaudoir**. This species occurs along the entire eastern slope of the Andes in Ecuador into the Cordillera Cóndor of northern Perú and is only active nocturnally. On some streams it is quite common. We found specimens during the daytime by turning over rocks and gravel along small to medium size mountain streams. Adults spend the day in small crevices of large boulders, usually >5 cm below the surface and most often on islands of rocks and not along the shore. At night we found them by wading in water up to a meter deep and jumping from boulder to boulder illuminating the rock surfaces with large flashlights. During the night the beetles are active on the tops and downstream sides of large, moss-covered boulders. Several species of *Oxycheila* were also active at night on these same boulders, but unlike the *Oxycheila* which regularly run into the water and escape by swimming in the current (Cummins 1992), *Oxygonia vuillefroyi* fly to nearby rocks. After being frightened from a boulder, several individuals landed on our hands next to the flashlight we were holding.

***Oxygonia moreti* Deuve**. Recently described (Deuve 1992), this is the largest species in the genus *Oxygonia* (>21 mm). It was previously known from only two female specimens from the western slope of the Andes in northern and central Ecuador. We found three males attracted to an ultraviolet light set on a large boulder between dusk and 10:00 PM next to a relatively deep and wide mountain stream near Mindo (1,300 m), Pichincha Province, in September 1993 and again in September 1995. Two individuals of *Oxygonia oberthuri* W. Horn were also found at the light, but they were only present at dusk and are known to be active diurnally. In March 1995, we found a single male active on large rocks in the middle of a wide mountain stream 17 km east of Santo Domingo (650 m), Pichincha Province, at 10:00 P.M. Three species of *Oxycheila* also occurred on this stream, but no other species of *Oxygonia* were found here after extensive searches at night and during the day. Recently the range of this species was extended considerably to the north where an additional female specimen was collected near the Colombian town of Querenel, La Rosita, in the western Department of Valle.

***Oxygonia oberthuri* W. Horn**. This is the most common species of the genus on the west slope of the Andes in Ecuador. We have found it from northern Ecuador to near the Peruvian border along small streams (<1 m wide) to medium size rivers (>15 m wide). Adults are active diurnally and forage on rocks and moss-covered vegetation near the water's surface. Individuals regularly fly to overhanging foliage to escape danger. Frequently we have seen up to five individuals along a fifty meter stretch of small streams in Cañar Province and Bolívar Province. The only other tiger beetle species we have found in the same habitat and locality are *Oxygonia moreti*. and two species of *Oxycheila*..

***Oxygonia floridula* Bates**. Found only in the southern portion of Ecuador along the eastern slope of the Andes, this species has the greatest density of individuals of any species of this genus we encountered. Along one stream above Macas, Morona Santiago Province, we saw up to twelve individuals per fifty meter stretch. Adults are diurnal and forage on large boulder surfaces in the middle of medium to small streams. They fly readily to other boulders or vegetation along the stream to escape danger. The bright coppery red

males and the emerald green females are also easily seen on their leaf perches overhanging the stream at night. One pair was found in coitus at night on a leaf overhanging the stream. *Oxygonia vuillefroyi*, *Oxygonia carissima* , *Oxygonia gloriola* and three species of *Oxycheila* were found together with *Oxygonia floridula* on various streams.

***Oxygonia gloriola* Bates**. We only have found this Ecuadorian endemic species at one site - south of the military garrison of Patuca in western Morona Santiago Province (720 m), in October 1995. Both males and females foraged on rocks in the middle of a small stream during the day. They flew to overhanging vegetation to escape danger. We also found *Oxygonia floridula* and the nominate race of *Odontocheila batesi* Chaudoir at the same site.

***Oxygonia buckleyi* Bates.** We also have found this Ecuadorian endemic species at only one site - along a steep and forested rocky stream northeast of the town of Limón, Morona Santiago Province. Here we saw five individuals foraging on a high, wet rock-face in a shaded portion of the stream. Each individual would alternately forage and fly up the rock-face until it reached a small pool 15 m above the stream surface. Then after some final foraging at this pool, the individual would fly down to the base of the rock face and again begin its vertical climb. Each cycle of vertical foraging and flying up the rock-face would take about fifteen minutes before beginning again at the bottom. We found no other species of *Oxygonia* at this site, but *Odontocheila vermiculata* Bates was common along the side of the more open portions of this stream.

***Oxygonia uniformis* W. Horn.** Only 12-13 mm in length, this is the smallest species of *Oxygonia* in Ecuador. It is known only from the central part of the eastern slope of the Andes in Ecuador. We found it at a relatively low elevation (<1,140 m) along a narrow (2 m wide) stream almost overgrown with vegetation. The adults are active diurnally but individuals were extremely hard to see as they foraged in shaded areas on moss-covered logs and rocks in and along the edge of the stream. They quickly flew up to land on leaves of overhanging vegetation when disturbed. The stream was relatively slow moving and had little to no white water. We also collected two other species of *Oxygonia* at this site, *O. carissima* and *O. moronensis.*

***Oxygonia moronensis* Bates**. Adults of this species are the second largest of the genus in Ecuador (15.5-17 mm). The female and male are both dark blue and show little sexual dimorphism. We collected two specimens on a small stream in southwestern Napo Province at 1,140 m elevation. They were active during the day time. Unlike *Oxygonia carissima* and *O. uniformis*, the other syntopic species on this stream, individuals of *O. moronensis* flew from rock to rock and made no attempt to fly up into the overhanging vegetation along the stream. In September of 1995, on another stream in western Pastaza Province (1,250 m), we found several individuals active at night foraging on rocks in the middle of a moderately large stream.

DISCUSSION

Although specimens of this genus are rare in collections, this probably does not reflect their actual abundance and distribution. Few collectors turn over rocks along mountain streams during the day or attempt the often dangerous procedure of walking in these fast-flowing mountain streams either at night or during the day. The rocks are slippery and the footing frequently unsure. Once a beetle is seen, attempting to approach it during the day, or keep the flashlight on it at night and simultaneously watch the footing, is not simple. We have found that the use of footwear with felt soles (similar to those used by trout fishermen) can be helpful in maneuvering on some slippery substrates. With practice and extreme caution, using this technique of collecting in the mountains of Costa Rica, Panamá, Colombia, Ecuador, Perú and Bolivia will increase our knowledge of this genus. These data can then be used to confirm male and female morphs of the same species, and determine distributions, habitats, and natural history more accurately.

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