MORPHOLOGICAL CHARACTERISTICS OF
LEPTODRUSUS BUDTZI ULM. IN THE
IMMATURE STAGES

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SUMMARY
The immature stages of Leptodrusus budtzi Ulm. endemic to Sardinia and Corsica are described for the first time. The taxonomic characteristic for certain and immediate identification of the larva is the clear field on the posterior two-thirds of the pronotum, which is delimited by a series of arches. The typical drusini hump is more pronounced than it is in other Italian drusini. These, other classification characteristic, the larval case and the pupa are shown in a series of designs.

INTRODUCTION
Ulmer classified a male specimen of drusinus, found by Peteson at Vizzavona in Corsica, as belonging to the Potamorites genus. Ulmer, however, doubted that the number of spurs was a sufficient taxonomic characteristic for certain identification of a genus. He named this specimen Potamorites budtzii. Mosely confirmed Ulmer's classification in 1930, but, in 1955, Schmid was of the opinion that Potamorites budtzii was, in fact, the genus type of Leptodrusus and he termed it L. budtzi.

Until 1964, neither the larva nor the pupa of Leptodrusus budtzi, which is endemic to Sardinia and Corsica, had ever been described. We decided to fill this gap and, after examining more than 100 specimens collected in Gallura, Sassari, between 1964 and 1966 produced a series of designs that clearly illustrate the main morphological features of the immature stages of the species.

DESCRIPTION
The larval case (Fig. 1b) is conical and only slightly tapered at the posterior apex. The overall length is 16–19 mm; the width at the anterior opening is 3–4 mm and at the posterior 2–2.1 mm. The case is compact, there is both dorsal and ventral flattening, it is fluted and more oblique at the anterior orifice than is the case of any other European drusini. Small, sometimes protruding, stones are used for constructing the case. Freed from its case the larva (Fig. 1a) measures 13–14 mm in length and 3–3.5 in width at the first abdominal segment. The head (Fig. 2c) is brownish, oval and extremely

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Fig. 1. *Leptodrussus budzi* Ulm.
a - larva; b - larval case; c - pupa.

hypogonate. The occipital region is lighter, but edged by a dark stripe. The typical drusini crest is absent. The eyes are located slightly behind the median periocular heart shaped marking, which suggests that the larva looks forward and upward. The labrum is chitinous, transversal and
Fig. 2. Leptodrusus budzi Ulm.
a – pronotum, dorsal view
b – pronotum, lateral view
c – head, lateral view

elliptical; the lateral convex lobes have tufts of yellow hairs which extend over the entire ventral surface. The dorsal surface of the mandibles are flat and the internal line is free of teeth, but there is a single undulation and an apical tooth curved like a spoon. The labial lobe terminates in a fleshy bulb and is carpeted with short hooked setae. The stipes are trapezoid and
less sclerified than the cardum. The whole of the maxillary labium cuticle forms a characteristic gently rippled sculptured border.

The pronotum (Fig. 2a, b) is the most important distinguishing taxonomic feature, it is quadrangular, deeply convex, well sclerified, the same colour as the head in the anterior third, but lighter in the posterior two-thirds, where there is a large brownish-yellow zone limited anteriorly by a series of arches. The anterior margin is fringed with pale flexible cilia between which

Fig. 3. *Leptodrurus budzi* Ulm.
legs, right side.
eight tiny spines stick out from each side. The transversal furrow which
demarks the division between the anterior third and the posterior two-thirds
is indented, particularly the darker medial tract. The posterior field forms the
pronounced hump typical of the drusini.

The mesonotum is larger than the pronotum and the two adjacent plaques
form a rectangular plate. There is trapezoid darkening at the anterior margin,
which narrows towards the base, and two comma-like marks on a light lateral,
posterior field. The lateral posterior margin is very dark and has a pronounced
black border.

The fleshy metanotum is almost rectangular and has anterior median
clerites. The half-moon lateral plaques are well sclerified, while the triangular
posterior ones are less so.

The legs are yellowish with the dorsal face of the trochanter tending
to red. The borders are blackened at the joint (Fig. 3). The coxa of
the right anterior leg is cuneiform and conical. The trochanter has two
apical spurs, one larger than the other, in front of which there is a tuft of
yellow setae and two wide-based median spurs among the tiny spines that
fringe the internal edge of the femur, which is one of the main distinguishing
characteristics. The tibia is narrower than the femur. It is equipped with a
toothbrush of tiny spines, which are repeated on the tarsum, and two apical
spurs.

The right median leg anterior profile of the coxa is straight and the posterior
convex. There is a tuft of pale flexible setae below the apical spur on the
trochanter. Small spines arranged like a comb run along the proximal
two-thirds of the ventral femur and there are two apical spurs. A few tiny
spines are seen on the tarsum and the pretarsal claw is equipped with a robust
basal spine.

The right posterior leg coxa is similar to that of the median leg, but the pale
yellow setae below the spur are absent. The femur is shorter and the tibia is
folded back at the joint.

The abdomen is mainly cylindrical. The first segment is darker than the
others and is the widest part. The wart-like protubrances are domed laterally
and more pointed dorsally and have setae spaced around them. There are
less setae on the other segments and, from the second to the sixth, there
are two postsegmental lateral median setae. The lateral line, which is formed
by a blackish-brown fringe, begins at the lateral posterior margin of the
second segment and ends at the eighth. Presegmental and postsegmental single
gills are observed on the second to seventh segments, but on the last there
are only presegmental gills.

The large anal claw is formed by a roughly trapezoid fixed part, the dorsal
proximal border of which is black. The small anal claw forms a right angle
with the segment on which it is embedded and there is a spine on its edge.

The pupa (Fig. 1c) has an elliptical transversal head with large hemispherical
protuding brownish-violet eyes. The filamentary antenna are usually made up
of sixty-nine segments. They are longer than the body and curve back dorsally
and recurve up at the apex. There is a group of thin black robust hooked
setae on the pale squarish fleshy labrum. The mandible has a robust almost
conical black base which is tapered in the lower half and toothed on the
internal edge. The pterothecae have a slightly sclerified border, the posterior ones are considerably larger and wider than the anterior ones. About thirty small teeth are seen on the posterior lobes of the first abdominal tergum. The case hooking plates are found from the fourth to seventh segments and the hooks, themselves, are arranged in a fairly regular pattern. Two small presegmental and two large post segmental plaques are located on the fifth segment. The case is formed by cutting the larval house at the end. The overall length is 19.4 mm, the width 4.5 mm. The extremities are plugged with tiny stones and little pebbles bond together by a strong silky open weave web. The larvae are found in slow running streams with low carrying both near to and far from the source.

REFERENCES