

1 Subsistence Strategies in Bronze Age Southeastern Iberia: Insights from Motilla del
2 Azuer Phase 2 (ca. 1950 - 1875 cal BC)

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25 1. Introduction

26 The transition at the end of the 3rd millennium BC, the shift from the Chalcolithic
27 to the Bronze Age in southern Iberia, has been the subject of intense debate (e.g., Valera,
28 2015; Blanco-González et al., 2018; Hinz et al., 2019; Schirmacher et al., 2020, 2024;
29 Weinelt et al., 2021; Benítez & Mejías Moreno, 2022). The Bronze Age was a period of
30 profound transformation across Mediterranean Europe (Knapp & Van Dommelen, 2014)
31 that resulted in regional variability but comprised common trends in social organization,
32 long-distance exchange, transcultural interactions, and human mobility (Iacono et al.,
33 2022).

34 In the Iberian Peninsula, these dynamics took diverse regional forms, but also
35 reveal points of convergence, some of which intensified toward the end of the Bronze
36 Age (e.g., Burgess & O'Connor, 2008; Lull et al., 2013; Fontanals & Ruiz, 2023). Within
37 this broader framework, the Bronze Age communities of La Mancha stand out for their
38 distinctive settlement system. Alongside fortified hilltop sites, the region developed
39 unique lowland stone-built enclosures known as “motillas”. At least 20 motillas and
40 several hilltop settlements have been recorded in western Castilla - La Mancha, dated to
41 the Bronze Age (Nájera & Molina, 1977, 2004a, 2004b; Nájera, 1984; Lenguazco, 2016),
42 with 46 motillas currently documented in Ciudad Real province alone (Lenguazco, 2018).
43 Despite their significance, only a limited number of archaeological excavations have been
44 carried out, leaving many sites insufficiently studied.

45 Zooarchaeological research on the Motillas Culture is scarce. This gap has
46 hindered a detailed reconstruction of subsistence strategies and the assessment of their
47 degree of regional uniformity. Early studies at Motilla del Azuer and Motilla de los
48 Palacios highlighted differences in wild/domestic ratios but similar culling profiles
49 (Driesch & Boessneck, 1980). Subsequent analyses include Motilla del Azuer Trench 5
50 (Córdoba, 2017), Motilla de los Romeros (García, 1987), and Castillejo del Bonete. For
51 the latter, an unpublished report is cited in Benítez de Lugo et al. (2020) and updated by
52 Galindo et al. (2025), with the latter emphasizing the role of certain species in funerary
53 offerings. Additional work for this region has explored faunal remains in funerary
54 contexts (Benítez et al., 2020, 2022), osseous technology (Altamirano García, 2013), and
55 microfauna (Morales, 1986; Domínguez et al., 2019).

56 Compared to other regions of south-eastern Iberia, such as the Argaric culture
57 (e.g., Driesch, 1974; Lauk, 1976; Driesch et al., 1985; Milz, 1986; Friesch, 1987;
58 Contreras et al., 1992; Mateo & Vázquez, 1992; Manhart et al., 2000; Andúgar, 2016;

59 Tinoco, 2019; Beltrán & Tinoco, 2022) or the Levantine Bronze Age (e.g., Driesch &
60 Boessneck, 1969; Aguilar et al., 1992; Puigcerver, 1994; Barrachina & Sanchís, 2008;
61 Pérez, 2013; Benito, 2014), zooarchaeological studies in La Mancha remain limited.
62 While several regional syntheses have been produced for Iberia as a whole (e.g., Iborra
63 & Sanchís, 2009; Andúgar, 2016; Beltrán & Tinoco, 2022; Almeida et al., 2023;
64 Schirmmacher et al., 2024), La Mancha continues to be underrepresented within the
65 broader comparative framework.

66 This disparity partly reflects the early attention paid to Argaric contexts by Central
67 European archaeologists from the 1970s onwards and the subsequent momentum of
68 Levantine research (Morales, 2002; Riquelme, 2011). In contrast, the zooarchaeology of
69 the Motillas Culture continued somewhat underdeveloped. Addressing this imbalance,
70 the present paper provides a new zooarchaeological dataset for the region, based on a
71 large faunal assemblage from Motilla del Azuer Phase 2 (ca. 1950 - 1875 cal BC). This
72 analysis allows us to refine the understanding of subsistence strategies in Bronze Age La
73 Mancha and situate them within wider Iberian patterns.

74

75 2. Materials and Methods

76 2.1 Motilla del Azuer

77 Research on the Bronze Age in the Southern Meseta advanced significantly from
78 the 1970s onwards (Nájera & Molina, 1977), leading to the identification of 94 surface
79 sites in northern Ciudad Real province. Of these, 64 were assigned to the Early and
80 Middle Bronze Age, and nine to the Late and Final Bronze Age (Nájera & Molina,
81 2004b). Within this landscape, Motilla del Azuer, located near Daimiel in the floodplain
82 of the Azuer River (López et al., 2014), stands out as one of the most extensively
83 investigated sites (Figure 1). Excavated in 15 campaigns between 1974 and 2010, it was
84 declared a Historical-Artistic and Archaeological Monument in 1982 (Haro, 2011).

85 Motilla del Azuer comprises a fortified central tower, a trapezoidal courtyard with
86 a well over 16 m deep, connected to an aquifer (Nájera & Molina, 2004b), and an outer
87 residential area featuring huts, hearths, silos, and burials (Figure 2). The site is part of a
88 broader network of equidistant motillas, interpreted as a hierarchical system of territorial
89 control and agro-pastoral resource management complemented by hilltop settlements
90 (Nájera & Molina, 2004b).

91 The site is a chronological and functional reference for the Manchegan Bronze
92 Age, supported by more than seventy radiocarbon dates (Nájera et al., 2019). Four main

93 phases have been defined between ca. 2200 and 1350 cal BC (Nájera et al., 2012; López
94 et al., 2014). Phase 1 (2200 - 1950 cal BC) corresponds to an arid phase with the
95 construction of the tower and well, an economy based on livestock, cereal cultivation,
96 and evidence of violent funerary practices. Phase 2 (1950 - 1875 cal BC) involved
97 reinforcement of hydraulic structures and a decline in agriculture under increasing aridity.
98 Phase 3 (1875 - 1600 cal BC) corresponds to climatic recovery and renewed agricultural
99 and pastoral intensification. Finally, Phase 4 (1600 - 1350 cal BC) is associated with
100 abandonment, as rising water tables rendered the well unusable, and it was converted into
101 a cistern.

102 Archaeobotanical and zooarchaeological studies indicate mixed farming, with
103 wheats (*Triticum dicoccum*, *T. monococcum*, *T. durum/aestivum*), barley (*Hordeum*
104 *vulgare*), and legumes such as lentils and peas (Buxó, 1990; López et al., 2014), alongside
105 a diversified livestock management (Driesch & Boessneck, 1980). Stable isotope analyses
106 highlight dietary shifts: early phases show greater reliance on animal protein intake,
107 whereas Phase 4 reflects a shift towards increased plant consumption (Nájera et al., 2012).
108 These trends reflect adaptive strategies to environmental fluctuations and changing socio-
109 economic conditions. Overall, evidence suggests a community specialized in the
110 management of agricultural and livestock resources, possibly subordinate to a higher
111 political entity settled in sites such as Cerro de la Encantada, where differentiated grave
112 goods have been documented (Nájera et al., 2012).

113

114 2.2 Methods

115 The archaeological materials analyzed in this study originate from excavation
116 campaigns conducted in 2008, 2009, and 2010. These materials were recovered from
117 Trenches 1, 5, 6, 7, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 23, 30, and 55. Only materials
118 associated with stratigraphic units correlated with Phase 2, corresponding to the Early
119 Bronze Age and dated between 1950 and 1875 cal BC (Nájera et al., 2019), were
120 considered. Sediments were sieved, but only mammalian remains are presented,
121 excluding those identified as microfauna.

122 Standard methods for anatomical, taxonomic, and taphonomic analysis were
123 applied (Lyman, 1994; Reitz & Wing, 2008). Taxonomic and anatomical identifications
124 relied on reference works (e.g., Pales & Lambert, 1971; Barone, 1976; Pales & Garcia,
125 1981; Varela & Rodríguez, 2004) and comparative collections (Faculty of Veterinary
126 Medicine, University of Córdoba; private collection from the Sierra Morena; Arribas

127 Palau Archaeometry Laboratory, University of Granada; Laboratório de Arqueociências
128 and UNIARQ, University of Lisbon). Specific diagnostic criteria were applied to try to
129 distinguish bovine and cervid (Prummel, 1988), leporids (Callou, 2003; Llorente
130 Rodríguez, 2010), and the difficult cases of caprine (Boessneck et al., 1964; Prummel &
131 Frisch, 1986; Zeder & Lapham, 2010; Zeder & Pilaar, 2010; Llorente & Quiralte, 2016),
132 Quantification followed the Number of Specimens (NSP), Number of Identified
133 Specimens (NISP), and Minimum Number of Individuals (MNI) (Grayson, 1984). For
134 age-at-death assessments and species-specific identifications, comparative reference
135 collections at the Laboratory for Archaeozoological Studies, Leiden University, were also
136 consulted. Whenever possible, specimens were assigned to general age groups:
137 undetermined, infant, juvenile, subadult, adult, and senile.

138 All remains were weighed in grams. Specimens from the same species, inventory
139 number, and storage bag were weighed together, with pins and antlers recorded
140 separately. The minimum recorded unit was one gram, ensuring measurement error below
141 this threshold, which is particularly relevant for small taxa such as leporids. Pins and
142 antlers are presented with their total weight.

143 For anatomical representation, body parts were categorized using a customized
144 model based on Stiner (1991). Due to the difficulties of preparing a complete
145 taphonomical analysis of the studied collection, a randomly selected subsample of
146 materials from Trench 17, mostly related to sector A of the excavation, was examined in
147 greater detail. This allows for an initial appraisal of taphonomical histories that can be
148 further explored in the future. Recorded surface modifications included cut marks,
149 fracture patterns, carnivore tooth marks, and burning (Yravedra, 2013; Fernández &
150 Andrews, 2016), as well as oxide precipitation, water abrasion (Fernández & Andrews,
151 2003), and weathering (Behrensmeier, 1978). Specimen preservation (complete, nearly
152 complete, or fragmentary) and approximate size were recorded to evaluate overall
153 assemblage condition and identify potential breakage patterns.

154

155 3. Results

156 3.1 Anatomy and taxonomy

157 A total of 9203 specimens were analysed, of which 4668 (51%) were
158 taxonomically identified (Table 1). The remaining 4535 (49%) could not be identified
159 beyond body size; among these, 3956 (87%) correspond to medium-sized animals ranging
160 from leporids to *Cervus elaphus*, but predominantly consistent with caprine and suids.

161 All domestic taxa documented for the Bronze Age in the Iberian Peninsula are
162 represented.

163 Among the domestic assemblage (n = 3068, NISP = 65.7%), caprine are prevalent,
164 with 2010 (NISP = 43%) remains, including 75 articulated specimens. Within this group,
165 *Ovis aries* are more numerous compared to *Capra hircus*, but the majority of remains
166 were only identifiable to *Ovis/Capra*. Their general size suggests that they do not include
167 *Capra pyrenaica*, which is vestigial in the assemblage. *Sus scrofa domesticus* is the
168 second most common domestic taxa (NISP = 11%) and includes 119 partially articulated
169 remains. It is followed by *Bos taurus*, *Equus caballus*, and *Canis familiaris*. Wild fauna
170 (n = 1600, NISP = 34%) is dominated by leporids, comprising *Oryctolagus cuniculus*,
171 *Lepus granatensis*, and a few undetermined leporid specimens. *Cervus elaphus*, *Capra*
172 *pyrenaica*, several carnivores, and *Erinaceus europaeus* are present but in comparatively
173 smaller numbers

174 Cranial and axial elements are relatively better represented among domestic taxa,
175 whereas leporids exhibit a higher proportion of appendicular bones (Table 2, Figure 3).
176 Anatomical regions are represented with internal consistency across domestic taxa and
177 leporids. Still, some specific differences occur: stylopodial elements (humerus and femur)
178 are proportionally better represented in caprine and *Bos taurus* than in *Sus scrofa*
179 *domesticus*, while the latter show relatively more metapodials (Supplementary Material).
180 However, this should also relate to *Sus scrofa domesticus* higher anatomical count for
181 metapodials in comparison to caprine and *Bos taurus*; thus, their relative weight in the
182 assemblage is actually lower. A similar observation applies to acropodials. In axial
183 regions, ribs constitute more than 25% of remains in caprine and *Bos taurus* but only
184 around 15% in *Sus scrofa domesticus*. Leporids present a relatively balanced distribution,
185 though cranial elements are slightly underrepresented in *Lepus granatensis* compared to
186 *Oryctolagus cuniculus*.

187 The estimated weight also adds relevant information. Caprine constitute the
188 heaviest domestic group, with a slightly greater contribution from *Ovis aries* than *Capra*
189 *hircus*. *Bos taurus* occupies the second position, followed by *Sus scrofa domesticus*.
190 *Equus caballus* remains weigh more on average than *Canis familiaris* by approximately
191 600g. Undetermined macrofauna, presumably from bovine and equids, total 579
192 specimens weighing 6367g, a substantial contribution though lower than the 8397g
193 recorded for mesofauna. The average specimen weight is 11g for macrofauna and 2g for
194 mesofauna. Among the main identified taxa, the heaviest mean values correspond to

195 *Equus caballus* (28 g), *Bos taurus* (27g), and *Cervus elaphus* (20g), followed by caprine
196 (5g), *Sus scrofa domesticus* (8g), *Oryctolagus cuniculus* (<1g), and *Lepus granatensis*
197 (1g). These data suggest a relationship between body size and mean specimen weight,
198 while also reflecting differences in preservation state, fragmentation, and anatomical
199 representation among species.

200

201 3.2 Kill-off patterns

202 In this assemblage, quantification based on paired bone tracking and grouping
203 individuals into age cohorts is more reliable than attempts to assign age from dental wear,
204 as many remains lack complete diagnostic areas, allowing only minimum age estimates
205 without specifying maximum age. This limitation has resulted in a high proportion of
206 individuals whose age can only be estimated within a broad subadult-adult range using
207 general morphological criteria such as cortical development, bone surface texture, and
208 relative volume.

209 MNI estimates reinforce the NISP-based patterns, highlighting the predominance
210 of caprine in domestic herding strategies complemented by smaller but significant
211 contributions of other species (Table 1, Supplementary Material). Caprine are prevalent
212 with MNI = 71 individuals, corresponding mostly to *Ovis/Capra* (MNI = 62), but
213 including *Ovis aries* (MNI = 11) and *Capra hircus* (MNI = 8). A large portion of these
214 individuals are between subadult and adult stages (63%), followed by juvenile (18%),
215 infant (6%), subadult (6%), and senile (4%), with juvenile/adult and adult corresponding
216 to less than 3%. *Bos taurus* also shows a prevalence of undetermined age cohorts between
217 late subadult and adult (MNI=10), but including infant, juvenile, and subadult individuals
218 (MNI = 1 each). *Sus scrofa domesticus* is represented mostly by infant and juvenile
219 individuals (MNI = 4 each), with minimum values for subadult and undetermined.

220 Several additional individuals could be assigned to different age cohorts. Among
221 the more abundant taxa, *Equus caballus* is represented by one juvenile, one subadult, two
222 possible subadult/adult individuals, and one senile. *Canis familiaris* includes at least one
223 infant, one juvenile, one subadult, three subadult/adult individuals, and one
224 adult. Regarding leporids, both *Lepus granatensis* and *Oryctolagus cuniculus* correspond
225 mostly to subadult and/or adult individuals (n = 40 and 79, respectively).

226

227 3.3 Taphonomy

228 The analysed taphonomical subsample comprises 725 remains (7.9% of the total
229 collection). Of these, 660 show evidence of breakage (91%), while 65 specimens (9%)
230 are complete or nearly complete (Supplementary Material). The most frequent size
231 interval is 2.5-5 cm, with 322 remains (29%), followed by the 5-7.5 cm, with 209 remains
232 (29%). Size intervals 1-2.5 cm and 7.5-10 cm occur at relative frequencies close to 10%,
233 whereas other size categories are vestigial.

234 Butchery practices are well attested in the subsample. A total of 32 incisions were
235 identified, mainly on caprine remains (n = 14) and *Bos taurus* (n = 7). Vertebrae (n = 8)
236 and ribs (n = 8) are the most commonly cutmarked elements, although cranial and
237 appendicular bones also exhibit incisions. Chop marks (n = 8) are less frequent but occur
238 on various body parts, mostly in *Sus scrofa domesticus* (n = 3), with additional cases on
239 larger taxa.

240 Fresh breakage is abundant (n = 336), predominantly affecting taxonomically
241 indeterminate remains (n = 212, 63%) (Table 3). Although observed on both cranial and
242 postcranial axial bones, green fractures are particularly frequent in appendicular elements,
243 especially those with higher marrow content.

244 Tooth marks are comparatively scarce: rodent tooth marks are vestigial (n = 2),
245 but carnivore activity is attested by pits (n = 5), and furrowing (n = 32) that could have
246 other tooth marks associated. The latter is most common in indeterminate mesofauna (n
247 = 13) and caprine remains (n = 14), particularly on humeri, radii, and ulnae (n = 10).

248 Burned remains (n = 244) are also present, mostly with mild alterations (n = 205,
249 84%) compared to moderate (n = 9, 4%) and high degrees of burning (n = 30, 12%).
250 (Table 4). Mild burning is especially prevalent in indeterminate meso and macrofauna (n
251 = 30 and 58, respectively), caprine (n = 55), *Sus scrofa domesticus* (n = 22), and
252 *Oryctolagus cuniculus* (n = 18). Burned elements are distributed across all body parts but
253 occur most frequently in axial elements: cranial and mandibular remains (n =19),
254 vertebrae (n = 14), and ribs (n = 21). Long bones are also well represented, mainly
255 posterior elements. Moderate burning is less frequent, with a slight predominance in
256 caprine (n = 5) and appendicular bones (n = 5). High degrees of burning, including
257 carbonised and calcined remains, occur mainly in indeterminate macro and mesofauna (n
258 = 15), and caprine (n = 9), mostly affecting appendicular elements (n = 17).

259 A comparison of the size distribution between the general subsample and those
260 exhibiting fresh fractures and/or cut marks reveals similar relative frequencies in the
261 majority of size categories (Figure 4). While some differences occur in the ca. 2.5 cm and

262 5 cm groups, with higher frequencies in the total sample, the 7.5 cm category has an over
263 5% difference, with a prevalence in the anthropogenic sample.

264 Other taphonomical indicators related to the sedimentary environment were
265 registered. Trampling (n = 1), weathering (n = 5), fungal growth (n = 15), and water
266 abrasion (n = 18) are scarce. Manganese oxide precipitation (n = 33) occurs in higher
267 numbers, but vermiculations (n = 234) are the most recurrent indicator.

268

269 4. Discussion

270 4.1 Motilla del Azuer Phase 2

271 The Motilla del Azuer is situated on a plain near the water table, strategically
272 positioned to control access to water via a hydraulic system (Aranda et al., 2008; Molina
273 et al., 2005). Phase 2 corresponds to a period marked by pronounced aridity and low
274 precipitation (López et al., 2014), which contrasts with the significant demographic
275 growth recorded during this time. In this scenario, the settlement appears to have played
276 a key role within a network of sites, acting both as a generator and recipient of tributary
277 resources, which may have been redistributed, as suggested by the substantial storage
278 structures for cereals documented at the site (Aranda et al., 2008, p. 257).

279 The data presented, compared with the earlier study by Driesch & Boessneck
280 (1980), which corresponds to phases 1 to 3, reveal a notable stability in the proportions
281 of the main domestic taxa and red deer. This consistency is also supported by the smaller-
282 scale study of Córdoba (2017). Nonetheless, some differences are apparent: Driesch &
283 Boessneck (1980) reported caprine (NISP ranging from 32-38%), with *B. taurus* better
284 represented (23-28%), followed by *E. caballus* (11-13%) and *S. scrofa domesticus* (8-
285 11%). In contrast, our results show higher caprine NISP values (43%), followed by *S.*
286 *scrofa domesticus* (11%), *B. taurus* (7%), and similar values for *E. caballus* and *C.*
287 *familiaris* (2%). Differences are also notable in wild taxa, especially the much higher
288 representation of leporids (34% versus ca. 3% in Driesch & Boessneck 1980) and the
289 values for *C. elaphus* (1% versus 1-4%). The strong discrepancy in leporid representation
290 possibly reflects recovery bias or other methodological aspects in the earlier study.

291 Regarding slaughter patterns, the earlier slaughter of *S. scrofa domesticus* is
292 possibly aimed at avoiding maintenance beyond an optimal fattening point, explaining
293 their killing around one year of age. In the case of caprine, there is a slight tendency
294 toward later slaughter, though still aligned with the tender meat Models A and B proposed
295 by Helmer et al. (2007). Hence, the caprine exploitation model appears oriented toward a

296 mixed meat production strategy with preferential slaughter between six months and two
297 years, especially within the first year. For *B. taurus*, the available evidence does not allow
298 for definitive conclusions due to the sample size, but senile individuals are not recorded.
299 The high proportion of individuals of indeterminate age, most likely subadults or adults,
300 could suggest a standardized slaughter age corresponding to the end of their reproductive
301 or milk-producing potential. Comparing these results with Driesch & Boessneck (1980)
302 indicates that only about one-third of the small ruminants reached two years of age,
303 suggesting that most were slaughtered young, typically during their first year of life. The
304 high proportion of females points to the parallel exploitation of milk, while wool
305 production does not appear to have been a priority, as reflected by the slaughter ages.
306 According to those authors, this pattern was already documented in other contemporary
307 regions and aligns well with our results.

308 The taphonomical indicators recorded in the subsample represent a preliminary
309 assessment, but anthropogenic modifications are widely present on the main domestic
310 species, together with evidence of burning. Green fractures are abundant, indicating good
311 preservation despite diagenetic attrition and some amount of post-depositional
312 fragmentation. Different stages of butchery are attested by cutmarks and chop marks,
313 mostly on domestic taxa, being prevalent in caprine and *S. scrofa domesticus*, but also on
314 larger animals, most notably *B. taurus*. By contrast, *E. caballus* shows little processing
315 evidence. Fresh breakage is mainly concentrated on the diaphyseal portions of long bones
316 and is related to marrow extraction practices.

317 Burning is also significant in the subsample. Mild to moderate degrees of burning
318 are related to culinary practices and are common. They are affecting the most frequent
319 taxa, including meso and macrofauna, and are concentrated in axial elements, but are also
320 present in appendicular bones. More intense traces, such as carbonisation and calcination,
321 are comparatively less frequent and may reflect other processes beyond food preparation.

322 Tooth marks are relatively scarce. Although some could be due to anthropogenic
323 activity, they are mostly the result of carnivore damage, even if suid action cannot be
324 entirely discarded, especially on caprine and indeterminate remains of similar size. A
325 more detailed future analysis of tooth marks and associated behaviour may help clarify
326 these hypotheses.

327 Overall, preliminary taphonomical information combined with the complete
328 analysis of anatomical profiles shows a balanced representation of skeletal parts,
329 suggesting that domestic animals were slaughtered and processed within the settlement

330 itself. Furthermore, the organisation of the site would have facilitated the capture of small
331 game such as leporids, which, despite their low biomass, probably supplemented the diet.
332 The underrepresentation of cranial elements in these taxa may reflect discard practices
333 following capture or result from taphonomical factors affecting preservation, as is also
334 observed in ribs. Larger wild species, such as *C. elaphus*, are scarce, while *C.*
335 *pyrenaica* is vestigial. Their presence may reflect either deliberate hunting or
336 opportunistic captures at watering points frequented by these animals.

337

338 4.2 The regional record

339 A comparison of published evidence from the region dated to the transition
340 between the late 3rd and early 2nd millennium BC allows for the discussion of several
341 aspects (Figure 5). For comparative purposes, a threshold of 100 NISP was adopted;
342 therefore, smaller collections such as Cortijo de la Torre (Nocete, 1988) and Cabezo
343 Pardo (Iborra, 2014) were not included. Particular attention should be drawn to the large
344 assemblages exceeding 5000 NISP, such as Cerro de la Encina (Chapman, 1990), Cerro
345 de la Virgen (Chapman, 1990), Fuente Álamo (Manhart et al., 2000), and La Bastida
346 (Miguel et al., 1992). Assemblages with 1000-5000 NISP are also considered, namely
347 Cuesta del Negro (Chapman, 1990), Motilla del Azuer Phase 2 (Driesch & Boesneck,
348 1980; present study), and La Bastida (Miguel et al., 1992). Smaller collections with 100-
349 1000 NISP include Ereta del Pedregal (Perez Ripoll, 1990), Las Eras del Alcázar (Nocete
350 et al., 2013), Lloma de Betxí (Sarrión Montanana, 1998), Motilla de los Palacios (Driesch
351 & Boessnack, 1980), and Motilla de los Romeros (Garcia Perez, 1988).

352 Caprine constitute the best-represented group across nearly all sites, except
353 Motilla de los Romeros, where *Sus* and *Bos* predominate in Phases 1 and 2, respectively.
354 In the remaining sites, relative values for caprine vary between 42% and 75%, reaching
355 higher proportions in both studies of Motilla del Azuer, as well as at La Bastida, Motilla
356 de los Palacios, Las Eras del Alcázar, Fuente Álamo, and Cerro de la Virgen. In most
357 sites, cattle are the second most represented group, except Ereta del Pedregal, where *C.*
358 *elaphus* is abundant, and some Motillas where *Sus* are more frequent. Even in these latter
359 contexts, however, *Bos* usually occupy the third position, and their representation is
360 generally not far behind that of *Sus*.

361 As for wild fauna, large game is here represented by *C. elaphus* that plays a minor
362 role, usually representing less than 5% of assemblages. Its presence is nevertheless more

363 significant in Levantine contexts, such as Ereta del Pedregal, Lloma de Betxí, and Phases
364 II and III of La Bastida.

365 From a regional perspective, the profile at Motilla del Azuer during Phase 2 fits
366 within broader patterns observed in southeastern Iberia, where caprine herding increased
367 steadily throughout the Bronze Age (Ripoll, 1999). This trend partially parallels that of
368 Argaric contexts, even if diverging in the relative representativeness of *Bos* and *Sus*, with
369 *Bos* typically predominating in that cultural sphere. Nonetheless, the difference between
370 these two groups generally remains close to 5%, subject to site-specific variations
371 (Beltrán & Tinoco, 2022).

372 Another feature of Motilla del Azuer is the notable capture of small game, whereas
373 large game is rare. This scarcity appears to be a general characteristic of the Motilla
374 culture, possibly related to the limited availability of such fauna in the immediate
375 environment. This contrasts with the more frequent evidence for big-game hunting in
376 Levantine and Argaric areas (Beltrán, 2023; Beltrán & Tinoco, 2022). Still, the questions
377 surrounding leporid abundances should consider possible recovery bias and other issues.

378

379 5. Conclusion

380 The analysis of Phase 2 at Motilla del Azuer reveals a subsistence model
381 characteristic of the Bronze Age in southeastern Iberia, marked by a notable
382 predominance of caprine over other domestic taxa. This pattern, which echoes Neolithic
383 strategies in the Southeast regarding species representation, contrasts with the
384 Chalcolithic period, during which caprine herds were reduced in favour of bovines. It
385 develops within a context of climatic aridity and demographic growth, demonstrating an
386 economic planning adapted to the ecological conditions of the environment. The strategic
387 location of the settlement and its hydraulic system reinforce its role as a node for the
388 collection and redistribution of resources within a regional network. Slaughter and
389 consumption practices reflect a high degree of optimization, with differentiated strategies
390 according to species, age, and functionality, suggesting a consolidated technical
391 knowledge in animal exploitation.

392 Compared to other contexts of the southeastern Iberian Bronze Age, the Motilla
393 del Azuer model displays both similarities and divergences with the Argaric complex and
394 the Levantine area, particularly regarding the hierarchy of livestock species and the low
395 representation of large game hunting. These peculiarities may be determined by
396 environmental factors but also by cultural decisions that structured the settlement's diet

397 and economy. This study contributes to refining the understanding of subsistence
398 strategies within the framework of Bronze Age societies in Southern Iberia. The analysis
399 and publication of additional samples from Motilla del Azuer and other sites in the region
400 should help elucidate the variables behind the synchronic and diachronic subsistence
401 dynamics that are being registered.

402

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406 1.

407

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633 List of captions

634

635 Figures

636

637 Figure 1. Location of Motilla del Azuer and other sites mentioned in the text.

638

639 Figure 2. Motilla del Azuer seen from the East (Nájera et al., 2010: 390, Photograph M.
640 A. Blanco).

641

642 Figure 3. Anatomical profile histogram for the prevalent species identified at Motilla del
643 Azuer Phase 2.

644

645 Figure 4. Histogram comparing the size categories of the total subsample (n = 724) with
646 the remains with fresh breakage and cutmarks (n = 344), including incision and chop
647 marks.

648

649 Figure 5. Histogram with relative comparison of selected fauna for different sites.

650 Legend: Bas III = La Bastida F III (Miguel et al., 1992), M.Ro = Motilla de los Romeros

651 F2 (García Perez, 1988), M. Azuer = Motilla del Azuer Phase II (Driesch & Boessneck,

652 1980), M.Azuer* = Motilla del Azuer (this paper), M.Ro* = Motilla de los Romeros F1

653 (García Perez, 1988), M.Pal = Motilla de los Palacios II (Driesch & Boessneck, 1980),

654 L.Bet = Lloma del Betxí H1 (Sarrión Montanana, 1998), Eras = Las Eras del Alcázar 5

655 (Nocete et al., 2013), Bas II = La Bastida F II (Miguel et al., 1992), F. Álamo = Fuente

656 Álamo F1+2 (Manhart et al., 2000), E.Ped = Ereta del Pedregal F3+4 (Perez Ripoll,

657 1990), C.Negro = Cuesta del Negro Lvl 1-4 (Chapman, 1990), C. Virgen = Cerro de la

658 Virgen F3 (Chapman, 1990), C. Encina = Cerro de la Encina F1-2 (Chapman, 1990).

659

660

661 Tables

662

663 Table 1. Number of Specimens (NSP), Number of Identified Specimens (NISP),
664 Minimum Number of Individuals (MNI), Weight, and Weight/NISP ratio for Motilla del
665 Azuer Phase 2.

666

667 Table 2. Number of Identified Specimens (NISP) per element for the taxonomically
668 identified remains from Motilla del Azuer Phase 2. Legend: EQ = *Equus caballus*, BT =
669 *Bos taurus*, CAH = *Capra hircus*, OA = *Ovis aries*, O/C = *Ovis/Capra*, SSD = *Sus scrofa*
670 *domesticus*, CF = *Canis familiaris*, CEE = *Cervus elaphus*, CAP = *Capra pyrenaica*, LYP
671 = *Lynx pardinus*, VV = *Vulpes vulpes*, FS = *Felis silvestris*, MM = *Meles meles*, CAR =
672 Carnivora indet., LG = *Lepus granatensis*, ORC = *Oryctolagus cuniculus*, LEP =
673 Leporidae, EE = *Erinaceus europaeus*.

674

675 Table 3. Presence of indicators of fresh breakage per element and taxon. Legend: BT =
676 *Bos taurus*, CAH = *Capra hircus*, OA = *Ovis aries*, O/C = *Ovis/Capra*, SSD = *Sus scrofa*
677 *domesticus*, FS = *Felis silvestris*, LG = *Lepus granatensis*, ORC = *Oryctolagus cuniculus*,
678 Ind = Indeterminate, Ind Ma = Indeterminate Macrofauna, Ind Me = Indeterminate
679 Mesofauna, Ind Mi = Indeterminate Microfauna, LEP = Leporidae.

680

681 Table 4. Burned remains per type of burning, element, and taxa. Legend: EQ = *Equus*
682 *caballus*, BT = *Bos taurus*, CAH = *Capra hircus*, OA = *Ovis aries*, O/C = *Ovis/Capra*,
683 SSD = *Sus scrofa domesticus*, CF = *Canis familiaris*, CAR = Carnivora indet., LG =
684 *Lepus granatensis*, ORC = *Oryctolagus cuniculus*, LEP = Leporidae, Ind = Indeterminate,
685 Ind Ma = Indeterminate Macrofauna, Ind Me = Indeterminate Mesofauna, Ind Mi =
686 Indeterminate Microfauna, LEP = Leporidae.

687

688

689

690 Table 1
691

taxa/category	NSP	%	MNI	%	weight	%	weight /NISP
<i>Equus caballus</i>	114	2.4	5	2	3182	11.3	27.9
<i>Bos taurus</i>	308	6.6	13	5.3	8236	29.2	26.7
<i>Capra hircus</i>	98	2.1	8	3.3	949	3.4	9.7
<i>Ovis aries</i>	123	2.6	11	4.5	1061	3.8	8.6
<i>Ovis/Capra</i>	1789	38.3	52	21.2	7568	26.8	4.4
<i>Sus scrofa domesticus</i>	529	11.3	10	4.1	4101	14.5	10
<i>Canis familiaris</i>	107	2.3	7	2.9	601	2.1	5.6
domestic animals	3068	65.7	106	43.3	25698	91	8.9
<i>Cervus elaphus</i>	47	1	2	0.8	917	3.2	19.5
<i>Capra pyrenaica</i>	3	0.1	1	0.4	15	0.1	5
<i>Lynx pardinus</i>	1	<0.1	1	0.4	1	<0.1	1
<i>Vulpes vulpes</i>	17	0.4	1	0.4	37	0.1	2.2
<i>Felis silvestris</i>	11	0.2	2	0.8	30	0.1	2.7
<i>Meles meles</i>	5	0.1	1	0.4	29	0.1	5.8
Carnivora indet.	12	0.3	2	0.8	19	0.1	1.6
<i>Lepus granatensis</i>	570	12.7	41	16.7	702	2.5	1.2
<i>Oryctolagus cuniculus</i>	925	20.7	86	35.1	796	2.8	0.9
Leporidae indet.	4	0.1			4	<0.1	1
<i>Erinaceus europaeus</i>	5	0.1	2	0.8	1	<0.1	0.2
wild animals	1600	34.3	139	56.7	2551	9	1.6
NISP total	4668	100	245	100	28249	100	6.3
NISP total	4668	50.7			28249	65.7	
undetermined Macro	579				6367		11
undetermined Meso	3956				8397		2.1
total Undetermined	4535	49.3			14764	34.3	3.3
total	9203	100			43013	100	4.7

Table 2

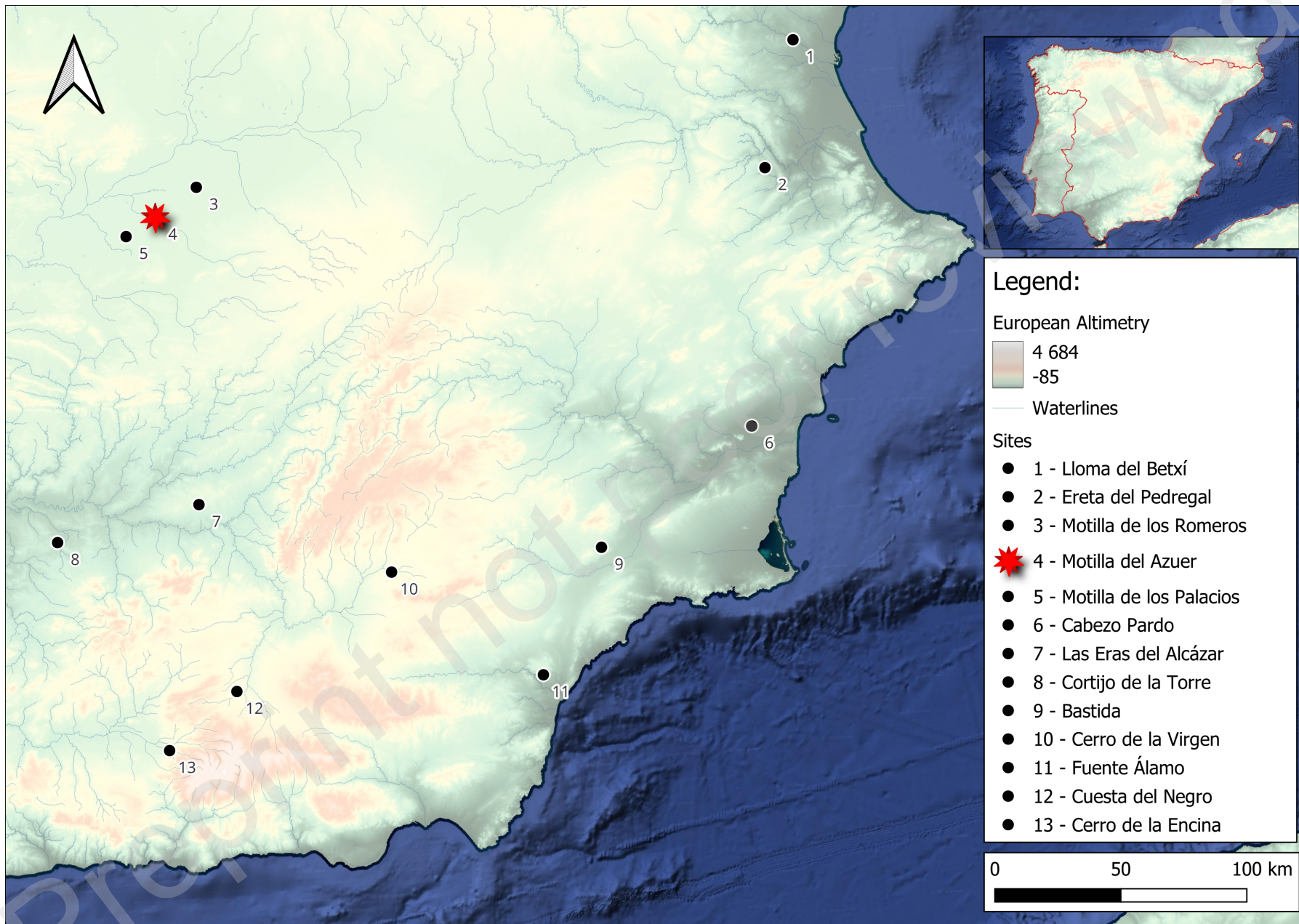
element	EQ	BT	CAH	OA	O/C	SSD	CF	CEE	CAP	LYP	VV	FS	MM	CAR	LG	ORC	LEP	tE	total	%
horncore/antler		4	16	3				5											28	0,6
cranium						2										1			3	0,1
neurocranium		1	2		2	6	2	1							1	4			19	0,4
viscerocranium	5	17	2		42	36	8	2			1	1	1		8	18			141	3,0
loose upper teeth	9	20	9	1	95	21	3							1		3			162	3,5
mandible	9	25	15	3	97	18	11	3			2	2	1		16	90		1	293	6,3
loose lower teeth	15	19	6	2	79	53	9	4						3	2	4			196	4,2
hyoid		2			11														13	0,3
atlas		2			5	2	5				1								15	0,3
axis	1	1			2	1	3												8	0,2
vertebrae	10	15			159	64								2	21	34			305	6,5
ribs	11	79			545	77	8	9			1		1	2	65	82	2		882	18,9
sacrum						1										3			4	0,1
scapula	1	6	4	8	26	23	2	2			2				41	59	1		175	3,7
humerus	3	11	5	9	104	16	2	1			1	3			38	63		1	257	5,5
ulna	4	9	5	11	31	19	5	1				2	1		34	56			178	3,8
radius	4	16	7	16	98	18	13	3					1	3	46	32			257	5,5
carpals	2	12			15	7													36	0,8
metacarpus	3	11	8	23	55	11	6	2	1		2				5				127	2,7
pelvis	5	6			67	8	3	2				1		1	47	97			242	5,2
femur	3	9			57	5	2				1				70	101			249	5,3
patella	1																		1	0,0
tibia	2	13	3		103	12	7	3			2				82	172		3	408	8,7
fibula						19						1							20	0,4
calcaneus	1	2	8		12	5		2			2				20	20			80	1,7
astragalus		4	1		13	2		1											22	0,5
tarsal	3	1			3	6													13	0,3
metatarsal	2	8	2		82	7	7	3	1			1			18	25			171	3,7
metapodial	12	1			24	43	9								40	55	1		186	4,0
1st phalanx	6	3	3		40	24	2	2		1	2				16	5			112	2,4
2nd phalanx	2	9	1		11	11		1	1							1			39	0,8
3rd phalanx		2	1		11	12													26	0,6
total	114	308	98	123	1789	529	107	47	3	1	17	11	5	12	570	925	4	5	4668	100

Table 3

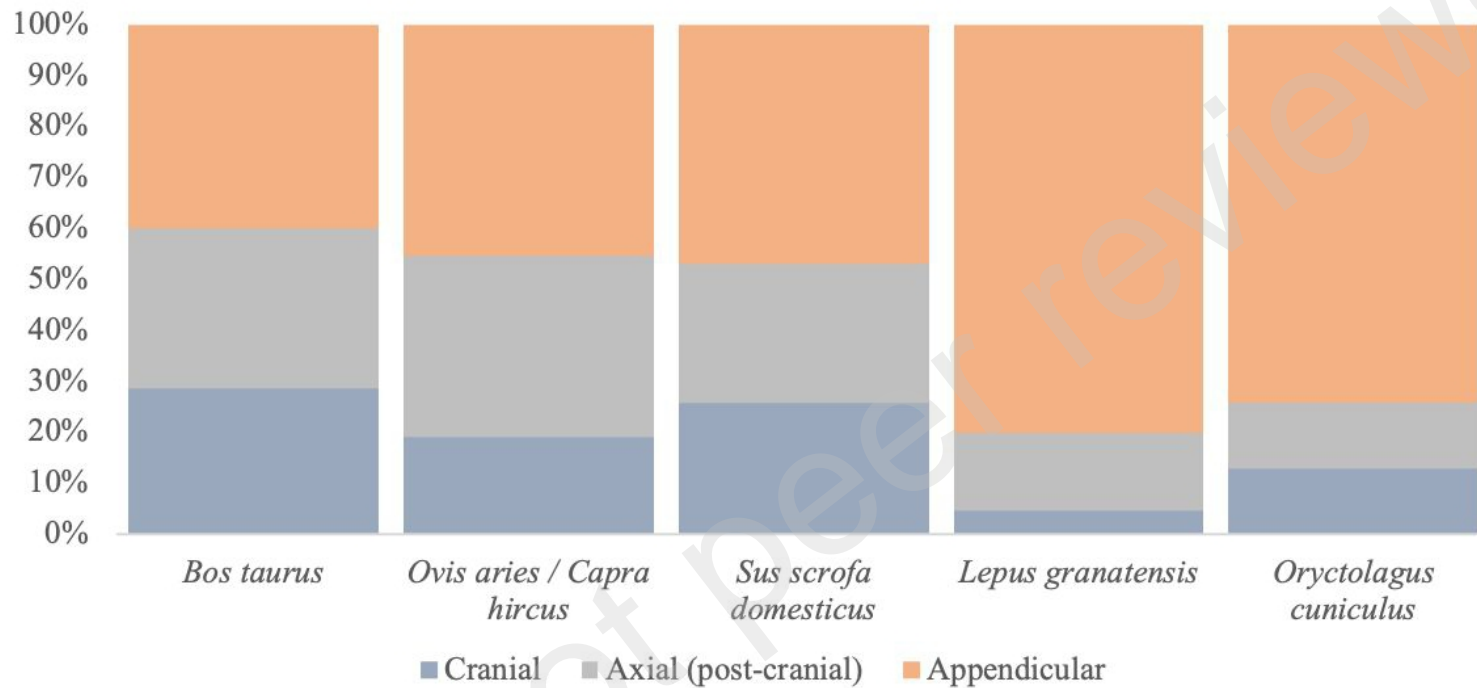
element	BT	CAH	OA	O/C	SSD	FS	LG	ORC	LEP	Ind	Ind Ma	Ind Me	Ind Mi	Total	%
mandible	2				3									5	1.5
ribs					1				1		1			3	0.9
scapula	1													1	0.3
humerus		2	3	2			3	5				1		16	4.8
ulna	1			3		1	1							6	1.8
radius	1	1	2	7	1		3	1						16	4.8
metacarpus			4	5										9	2.7
pelvis				1			1	7		1				10	3
femur				6	1		6	8						21	6.3
tibia	1		1	3	3		5	14						27	8
metatarsal	2		1	6										9	2.7
metapodial				1										1	0.3
ind.										3	64	138	7	212	63.1
Total	8	3	11	34	9	1	19	35	1	3	66	139	7	336	100
%	2.4	0.9	3.3	10.1	2.7	0.3	5.7	10.4	0.3	0.9	19.6	41.4	2.1	100	

Table 4

element	EQ	BT	CAH	OA	O/C	SSD	CF	CAR	LG	ORC	LEP	Ind	Ind Ma	Ind Me	total	%
horncore			1												1	0.4
neurocranium													1	1	2	0.8
viscerocranium					1	3	1							1	6	2.5
upper teeth		2			1										3	1.2
mandible		1	3	1	3	1								1	10	4.1
lower teeth		1													1	0.4
atlas					2										2	0.8
vertebrae		1			3	4				1	1		2	2	14	5.7
ribs		5			14	2		1			1	1		1	25	10.2
scapula										2					2	0.8
humerus				2	5	4				1	1			1	14	5.7
ulna		1			2	2			1	2				1	9	3.7
radius		1		1	5				2						9	3.7
metacarpal			1	3	4	1									9	3.7
pelvis				1		1				3			1		6	2.5
femur					3				1	5				1	10	4.1
tibia		1	1	1	3	2			3	2				1	14	5.7
calcaneus			2							1					3	1.2
metatarsal		1			4	1				1					7	2.9
metapodial	1				2	1									4	1.6
ind.												1	33	59	93	38.1
total	1	14	8	9	52	22	1	1	7	18	3	2	37	70	244	100
%	0.4	5.7	3.3	3.7	21.3	9	0.4	0.4	2.9	7.4	1.2	0.8	15.2	28.3	100	

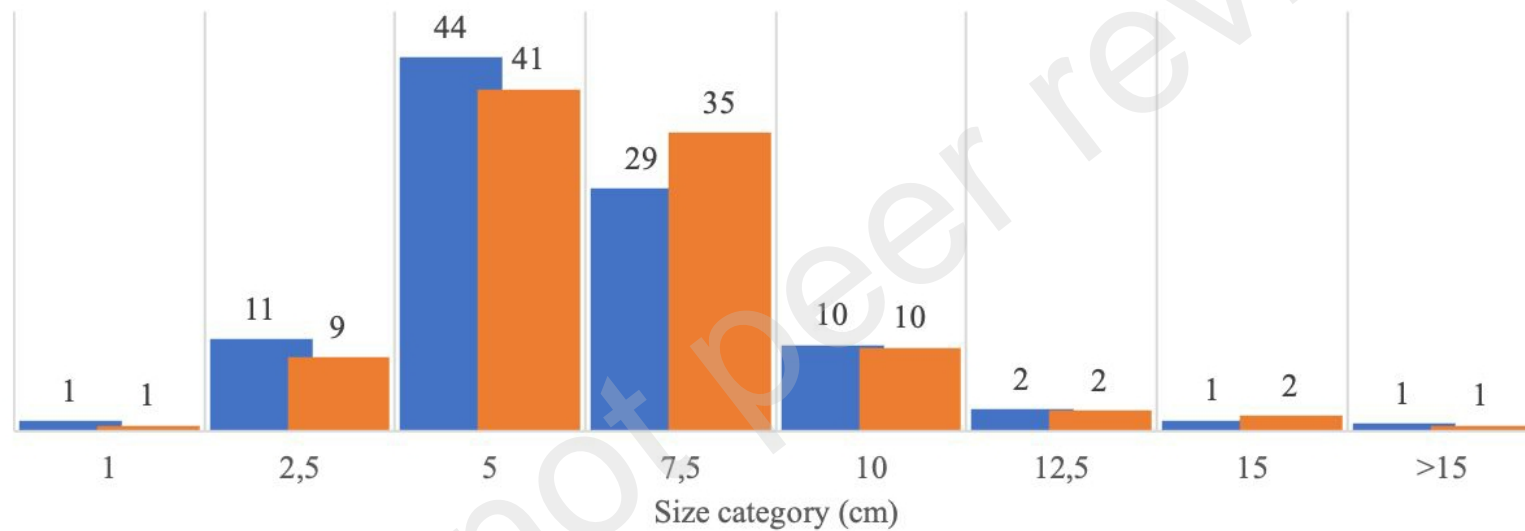






%

■ Total ■ Fresh breakage & cutmarks



0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

