Trophic diet of the Long-eared owl *Asio otus* (Linnaeus, 1758) (Aves, Strigidae) in the Daya d’El-Gouffa (Laghouat, Algeria)

Dieta trófica da coruja-pequena *Asio otus* (Linnaeus, 1758) (Aves, Strigidae) em Daya d’El-Gouffa (Laghouat, Argélia)

Dieta trófica del mochuelo *Asio otus* (Linnaeus, 1758) (Aves, Strigidae) en Daya d’El-Gouffa (Laghouat, Argelia)

ABSTRACT
This research aims to study the trophic diet of the long-eared owl *Asio otus* and based on the examination of 120 regurgitation pellets of this raptor. These pellets were collected during the period from August to November 2020, near the Daya d’El-Gouffa located in the region of Laghouat. The analysis of the 120 pellets revealed a total of 273 individuals divided into 39 species belonging to four zoological classes. The consumption of small mammals, mainly Rodentia-Gerbillidae, is very common in arid environments. These constitute the basis of the diet of this raptor. Of the four families of rodents consumed, the Gerbillidae family is the most dominant one. It clearly stands out from the other families with a very high rate of 92.5% of the total rodents consumed. The Dipodidae are the least consumed (4.8%). In terms of species, *Pachyuromus duprasi* is the most dominant species with 31.5%. The values of the Shannon-Weaver index seem to be high. The highest one is...
recorded in November with 4.2 bits against 3.1 bits recorded in August. The calculated equitability values tend towards one for all four months of the study, so the numbers of the different components of the long-eared owl diet tend to be in balance with one another. This implies that *Asiootus* behaves as a generalist opportunistic predator.

**Keywords:** *Asiootus*, pellets, rodents, diet, Laghouat, Algeria

**RESUMO**
Esta pesquisa tem como objetivo estudar a dieta trófica da coruja-orelhuda *Asiootus* e baseia-se no exame de 120 pelotas de regurgitação dessa ave de rapina. Essas pelotas foram coletadas durante o período de agosto a novembro de 2020, perto do Daya d'El-Gouffas, localizado na região de Laghouat. A análise das 120 pelotas revelou um total de 273 indivíduos divididos em 39 espécies pertencentes a quatro classes zoológicas. O consumo de pequenos mamíferos, principalmente Rodentia-Gerbillidae, é muito comum em ambientes áridos. Eles constituem a base da dieta dessa ave de rapina. Das quatro famílias de roedores consumidas, a família Gerbillidae é a mais dominante. Ela se destaca claramente das outras famílias com uma taxa muito alta de 92,5% do total de roedores consumidos. Os Dipodidae são os menos consumidos (4,8%). Em termos de espécies, *Pachyuromus duprasi* é a espécie mais dominante, com 31,5%. Os valores do índice de Shannon-Weaver parecem ser altos. O mais alto foi registrado em novembro, com 4,2 bits, contra 3,1 bits registrados em agosto. Os valores de equitabilidade calculados tendem a um em todos os quatro meses do estudo, de modo que os números dos diferentes componentes da dieta da coruja orelhuda tendem a estar em equilíbrio entre si. Isso implica que o *Asiootus* se comporta como um predador generalista e oportunista.

**Palavras-chave:** *Asiootus*, pelotas, roedores, dieta, Laghouat, Argélia

**RESUMEN**
Esta investigación tiene como objetivo estudiar la dieta trófica de la ibúhochico *Asiootus* y se basa en el examen de 120 bolitas de regurgitación de estarapaz. Estos pellets fueron recogidos durante el período de agosto a noviembre de 2020, cerca de la Daya d'El-Gouffas situada en la región de Laghouat. El análisis de los 120 gránulos reveló un total de 273 individuos divididos en 39 especies pertenecientes a cuatro clases zoológicas. El consumo de pequeños mamíferos, principalmente Rodentia-Gerbillidae, es muy común en ambientes áridos. Estos constituyen la base de la dieta de estarapaz. De las cuatro familias de roedores consumidas, la familia Gerbillidae es la más dominante. Se diferencia claramente del resto de familias con una tasa muy elevada del 92,5% del total de roedores consumidos. Los Dipodidae son los menos consumidos (4,8%). En términos de especies, *Pachyuromus duprasi* es la especie más dominante con un 31,5%. Los valores del índice de Shannon-Weaver parecen elevados. El más alto se registró en noviembre con 4,2 bits frente a los 3,1 bits registrados en agosto. Los valores de equidad calculados tienden a uno para los cuatro meses del estudio, por lo que las cantidades de los diferentes componentes de la dieta del búhochicotienden a estar en equilibrio entre sí. Esto implica que *Asiootus* se comporta como un depredador oportunista generalista.

**Palabras clave:** *Asiootus*, pellets, roedores, dieta, Laghouat, Argelia
1 INTRODUCTION

Raptors are very interesting study models because they shed pellets containing the indigestible and sometimes intact remains of their prey (Bertrand, 1992). The importance of raptors is mainly due to the role they play in nature by feeding on insect and rodent pests, which are sometimes formidable vectors of diseases that are very dangerous for humans and domestic animals (Blagosklonov, 1987). Thus, they are considered as useful auxiliaries for the farmer (Ramade, 1984). Among the most active are the Long-eared Owl *Asio otus* (Linnaeus, 1758). It is a medium-sized nocturnal bird of prey, slightly smaller than the Tawny Owl *Strix aluco* (Geroudet, 2000), and is characterised by its large, conspicuous orange eyes and highly visible erectile egrets, 3 to 4 cm long, which it can fold down almost completely at rest or in flight. Amongst the work carried out on the feeding behaviour of the Long-eared Owl are those of Amat et Soriguer (1981) in Spain, Barrea et al. (1984) in southern Morocco, Craig et al. (1985) in the USA, Leboulenger and Ternisier (1987) in Normandy, Murariu et al. (1991) in Romania, Galeotti and Canova (1994) in Italy, Roulin (1996) in Switzerland, Pirovano et al. (2000) and Bertolino et al. (2001) in Italy, Martin-Bouyer et al. (2002) in France, Alivizatos et al. (2005) in Greece, Blaciauskienė (2006) in Lithuania, Birrer (2009) in different regions of the world, Khaleghizadeh et al. (2009) in south-eastern Iran, Zhao et al. (2011) in China, Sharikov et al. (2018) in Russia and Tulis et al. (2021) in Serbia.

In Algeria, several authors have invested in the examination of regurgitation pellets of the Long-eared Owl, notably the work of (Talbi et al., 1999; Khemici et al., 2002; Baziz, 2002; Manaa, 2014) in different localities in Algeria. In southern Algeria, the species was reported by (Sekour et al., 2005, 2010) in the Mergueb nature reserve in M'sila and by (Souttou et al., 2015a, 2015b) in Djelfa. Chenchouni (2015) mentions it in the Aurès near Batna. Furthermore, Boumaaza (2017) noted the species in the North-East of Algeria near Guelma. It was also observed in the pine forest of Messida (El-Tarf) by the same author.

The aim of this study is to demonstrate the importance of the long-eared owl in the Dayad'El-Gouff in southern Algeria through the analysis of its discarded pellets, to highlight its trophic status and its ecological interest as a useful species and to determine the place of Rodentia-prey, a harmful species, and its impact on the environment. This will undoubtedly qualify the interest of this raptor in the agricultural and sanitary field, given the type of prey selected in its trophic menu such as rodents and birds. It seems that the present study on the trophic diet of *Asio otus* is the first in the Laghouat region.
2 MATERIALS AND METHODS

The present study is carried out in the region of Laghouat, which is located 400 km south of the capital Algiers. It is bounded to the north by the wilaya of Djelfa, to the west by that of El Bayadh, to the northwest by the wilaya of Tiaret and to the south by that of Ghardaïa. These coordinates are 33°48’ N. and 02°53’ E. The study area is part of the arid bioclimatic stage with cold winters. The selected station for collecting Asiootus regurgitation pellets is a Daya named Dayad'El-Gouffa located in Tadjrouna in the Laghouat region. The latter is located on the Saharian plateau, 80 km south of the city of Laghouat. It is a more or less vast depression, within which runoff water is concentrated. It is populated by deciduous structures of the Atlas pistachio Pistacia atlantica Linné, 1753 associated with a shrubby species, the Jujube Zizyphus lotus (L.), which forms groupings of several meters that offer a real refuge for rodents and which shelter an important biodiversity (Pouget, 1980).

The station was chosen because of the presence of the long-eared owl Asiootus, the abundance and accessibility of rodents, the preferred prey of this raptor which frequents arid environments, and also because of the presence of a considerable number of regurgitation pellets at the foot of trees, the raptor's resting places (Figure 1).

Figure 1 . Geographical location of the study area

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The method adopted for the study of the trophic menu of the long-eared owl is the analysis of the pellets of rejection. The pellets are elongated and greyish in colour. They have a shiny appearance when fresh and wet. Older pellets, on the other hand, have a drier consistency and a pale, light grey colour. They are difficult to find, except on daytime resting places.
In the Daya d'El-Gouffa, 120 regurgitation pellets were collected from the foot of *Pistaciaatlantica* from August to November 2020, at a rate of 30 pellets per month. They are then stored in paper cones on which the place and date of collection are mentioned. In the laboratory, they are analysed by the aqueous wet method, which involves two main stages, maceration of the pellets in water and then separation, identification and counting of the bone pieces (Figure 2).

![Figure 2 - Field stations for collection of pellets](image)

The results are processed using ecological composition indices such as total richness (S), which is the total number of species found in all the rejected pellets analysed (Blondel, 1975), the centesimal frequency (CF%), which is the ratio of the number of individuals of a prey species (ni) to the total number of individuals of all species (N) (Zaime and Gautier, 1989) and the Biomass (B%), which is the ratio of the weight of individuals of a prey (pi) to the total weight of the various prey (p) according to (Vivien, 1973). Structure indices are also used, such as the Shannon-Weaver diversity index (H') in bits and the equitability index E (Blondel, 1975).

3 RESULTS AND DISCUSSIONS

The measurement values of the *Asiootus* pellets obtained show that the average length is 44 mm. For the large diameter, the average values are 24.5 mm (Figure 3).

![Figure 3 - Asiootus reject pellet](image)
The results obtained in the present study are similar to those found by Talbi et al. (1999) near Staouéli, where they mention an average length of 35.8±7.8 mm and an average value for the large diameter equal to 25±2.8 mm. Similarly, Baziz (2002) on the Algerian coast notes a mean length of 34.58±7.8 mm against a mean width of 20.03±3.58 mm.

On the other hand, Souttouet al. (2015b) in the Djelfa region, found higher values of 54.17±17.79 mm for the mean length and 29.52±7.55 mm for the mean value of the large diameter. In contrast, Barreau et al (1984) in Morocco report a smaller ball size of 20 mm. In south-eastern Iran (in Zabol), Khaleghizadehet al. (2009), found average pellet sizes somewhat smaller than those found in the present study. They are 37.5 mm for the lengths and 21.0 mm for the large diameter.

The raptor can ingest few preys, each having a large size or many preys of small size. In fact, the dimensions of the pellets of the Long-eared Owl depend on the size and the number of prey per pellet ingested by this raptor, the greater the number of prey per pellet, the size of the pellet is large. At the region of the daya El Gouffa Asiootus consumes more medium-sized prey such as Pachyuromusduprasi.

The analysis of all Asiootus regurgitation pellets found in the Dayad'El-Gouffa in 2020 resulted in the enumeration of 273 individuals, 39 species belonging to 10 orders and four animal classes (Tab 1).

<table>
<thead>
<tr>
<th>Classes</th>
<th>Orders</th>
<th>Species</th>
<th>ni</th>
<th>CF%</th>
<th>B%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insecta</td>
<td>Coleoptera</td>
<td>Staphilinidaesp. ind.</td>
<td>1</td>
<td>0.37</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Carabidaesp. 1 ind.</td>
<td>1</td>
<td>0.37</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Carabidaesp. 2 ind.</td>
<td>1</td>
<td>0.37</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Harpalussp.</td>
<td>3</td>
<td>1.10</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tenebrionidaesp.</td>
<td>1</td>
<td>0.37</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Akissp.</td>
<td>2</td>
<td>0.73</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pimeliaesp.</td>
<td>2</td>
<td>0.73</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rhizotrogussp.</td>
<td>5</td>
<td>1.83</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pentatomidaesp. ind.</td>
<td>1</td>
<td>0.37</td>
<td>-</td>
</tr>
<tr>
<td>Hymenoptera</td>
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<td>Crematogasterssp.</td>
<td>9</td>
<td>3.30</td>
<td>-</td>
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<tr>
<td></td>
<td></td>
<td>Cataglyphissp.</td>
<td>5</td>
<td>1.83</td>
<td>-</td>
</tr>
<tr>
<td>Reptilia</td>
<td>Reptilia O. Ind.</td>
<td>Reptiliaspind</td>
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<td>0.37</td>
<td>0.81</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aves sp.</td>
<td>13</td>
<td>4.76</td>
<td>3.35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Passeriformes sp. ind.</td>
<td>6</td>
<td>2.20</td>
<td>1.74</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Passersp.</td>
<td>5</td>
<td>1.83</td>
<td>1.29</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Turdidaesp. ind.</td>
<td>2</td>
<td>0.73</td>
<td>1.03</td>
</tr>
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</table>
The consumption of small mammals is very important, they are represented by a high rate of 68.13% followed by birds with a rate of 18.7% and insects with 12.8%. Reptiles are the least consumed with 0.37% (Figure 4).

Figure 4. Percentages of different animal classes found in the diet of the eagle-owl during the present study.
The present results are comparable to those of Souttou et al. (2015 b) in an agricultural environment at El-Mâalba in Djelfa (southern Algeria), who noted a high predation rate of Mammalia with a rate of 70.4%, followed by birds with 19.7% and insects with 9.9%. In the same region, Souttou et al. (2015 a) in a forest environment in El-Karia report that Rodentia also dominate with 92.08% in the diet of the medium-sized owl.

The same is true for Sekouret et al. (2010) who report a percentage of 43.5% of rodents, 37.5% of birds and 17.4% of insects analysed in 60 pellets of the long-eared owl collected in the Mergueb Nature Reserve in M'sila (southern Algeria).

A study of the diet of the long-eared owl by Amat and Soriguer (1981) in western Spain revealed a rate of 75.6% for small mammals and 11% for birds. These results are close to those obtained in the present study. In Spain, Delibes et al. (1984) noted a high abundance of small mammals of 99.1%. In Yugoslavia, Tome (1991) underlines a high rate of Mammalia in the diet of the long-eared owl with 99%. Similarly, Galeotti and Canova (1994) in Italy, also mention that the Long-eared Owl feeds mainly on rodents with 89.6% and birds with 10.2%. In France, Martin-Bouyer et al. (2002), on a total of 208 regurgitation pellets analysed, noted a high consumption of mammals with 90.9% of the owl’s prey and 7.92% of birds. In Iran, Khaleghizadeh et al. (2009) reported the presence of rodents in 99% of the analysed pellets (250 pellets). In China, Zhao et al. (2011) also noted the dominance of Mammalia with a rate of 97%. Similarly, Hizal (2013) in Turkey, reports the importance of Rodentia (CF% = 93.8%). According to Milchev and Ivanov (2016), the winter diet of long-eared owls in a common roost in Bulgaria shows 3151 prey items and rodents form the majority of the food (97.0%) while shrews, birds and beetles constitute a fragmentary percentage of (3.0%). Near Mexico, Gonzalez-Rojas et al. (2017) found in 120 pellets collected during the winter period in the Janos grasslands, a rate of 95.74% of small mammals. Even Selçuk et al. (2019) in Turkey, obtained in 130 analysed pellets a high consumption of Mammalia (98.64%). Szepetal. (2018) in Hungary, also note a dominance of Mammalia with 21 species (FC % = 97.5%). Kucherenkoet al. (2020), in 88 regurgitation pellets of Asiootus, noted a consumption of 100% small mammals represented mainly by Microtus socialis (74.4%).

In the light of these results, the long-eared owl is an auxiliary predator against rodents that are crop predators and vectors of diseases which are sometimes very dangerous to humans and domestic animals.

In contrast, Bertrand (1992) in the Pyrenees, Göcer (2016) in Turkey and Baker et al. (2020) in Jordan report a high dominance of birds in the diet of the Long-eared Owl with 70%, 100% and 62.43% respectively (between sparrows and greenfinches).
Khemici *et al.* (2002) in the Algerian coastline report a high dominance of birds in the food web of the Long-eared Owl with 54.2%. In Russia, Sharikov *et al.* (2018) mention the presence of fish, a rare prey in the diet of the medium-sized owl.

The diet of *Asio otus* is not limited to rodents only, it can be diversified and also include birds, fish and even insects.

It should be noted that within the Mammalia, the Rodentia play a major role in the diet of the Great Horned Owl, with four families and a clear dominance of the Gerbillidae with 92.47% of all rodents consumed, followed by the Dipodidae with a low rate of 4.84%. The other families are poorly represented (Figure 5).

Rodentia are the most numerous, the species *Pachyuromus duprasi* is the most consumed with 86 individuals (31.5%) of the total prey, followed by *Gerbillus nanus* with 21 individuals (7.7%). In third position are *Meriones libycus*, Aves sp. and *Sylvia* sp. with 13 individuals each (4.8%). The other species correspond with low centesimal frequencies (0.37% ≤ FC% ≤ 4.4%). It should be noted that the main part of the diet of the long-eared owl is composed of rodents (Tab. 1). This can be explained by the fact that rodents are species that live in large numbers in arid environments. It is therefore not surprising that these prey are strongly represented in the trophic menu of the Long-eared owl.

![Figure 5. Centesimal frequencies of families of rodents found in the diet of *A. otus* during the present study](image)

Prepared by the authors (2024)

In the steppe areas of the Djelfa region, Souttouet *et al.* (2015b) note that the Gerbille *Gerbillus campestris* dominates the diet of the long-eared owl with 40.6%, followed by *Meriones shawii* with 38.6%. In terms of biomass, Shaw’s Meriones is the most profitable with B = 69.8%. On the other hand, Sekouret *et al.* (2005) in the Mergueb Nature Reserve in M’sila mention the dominance of birds, in particular species of the *Passer genus* with 20.7%. In the Arles region, Bergier and Badan (1986)
also noted a high consumption of *Mus musculus* with 70.6%. However, in Italy Galeotti and Canova (1994) mention that among the prey eaten by the long-eared Owl, *Apodemus sylvaticus* is the most dominant prey with a rate of 41.8%. In contrast, Zhao *et al.* (2011) in China, note the predominance of *Mus musculus* with 40.0% of prey ingested. In the high altitude steppes of Turkey, Selçuk *et al.* (2019) report the dominance of *Microtus* sp. (81.63%) in the summer diet of the long-eared owl.

Also in Turkey Beskardes *et al.* (2020) found a rate of 97.9% for small mammals and 89.6% for rodents. In Romania and Moldova, Nistreanu *et al.* (2020) report that rodents were the main trophic source and constituted ≥ 96% in the two sites studied. Similarly, Kucherenko *et al.* (2020), in the western part of the Crimean Peninsula, *Microtus socialis* was the most consumed prey with 74.4%.

According to Tulis *et al.* (2021), owl diets are undergoing qualitative changes in different regions of their range. During the four winters (from 2014-2015 to 2017-2018), owl pellets were collected from three winter roosts located in the southern part of the Pannonian Plain, in the Serbian province of Vojvodina. In 8070 prey items from the pellets, 16 mammal species and 32 bird species were identified. The Common Vole was the dominant prey species with a proportion ranging from 27.4% to 71.6%. The family Muridae constituted a complementary part of the diet: *Mus* sp., wood mice and harvest mice, during all winters. Birds were also major additional prey in the winter of 2014-2015, accounting for 10.6%.

It should be noted that, according to several works both in Algeria and in the world, the trophic menu of Asiootus comprises predominantly rodents, with some exceptions.

In terms of Biomass, the species *Pachyuromus duprasi* is the most profitable in terms of biomass with a rate of 36.01%, followed by *Psammomys obesus* with 12.9%. Several authors emphasise the high consumption of Mammalia, in particular Rodentia, in the diet of Long-eared Owls worldwide. Indeed, Soutou *et al.* (2015a) near Djelfa note that rodents are the most profitable species in terms of biomass with 99.86%. Even Alivizatos *et al.* (2005) in two stations in Greece, reveal the high consumption of small mammals with (B=87% for Nestos Delta station) and (B=79% for Porto Lagos station). Similarly, in Iran Khaleghizadeh *et al.* (2009) note that rodents are the most profitable in terms of biomass with 97%. On the other hand, Zhao *et al.* (2011) in China mention that small mammals are the most ingested (B=97.5%). They are mainly represented by *Meriones meridianus* which is the most profitable prey in terms of biomass with B=48.8%. Again Kitowski (2013) in Poland also notes a high consumption of small mammals (FC%=98.5%; B%=97.3%) *Microtus* sp. is the species with the highest biomass (B=79.9%). In Bulgaria, Milchev and Ivanov (2016) also show that Rodentia are the most profitable in biomass (B=97.2%). Selçuk *et al.* (2019), obtain a high Biomass rate of ingested Mammalia (B= 99.28%).
The diversity of prey species is medium to high. Indeed, the Shannon diversity index ($H'$) varies between 3.1 bits in August and 4.2 bits in November (Tab. 2).

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Daya El-Gouffa-2020</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>August</td>
</tr>
<tr>
<td>$H'$ (Bits)</td>
<td>3,1</td>
</tr>
<tr>
<td>$H'$ Max (Bits)</td>
<td>4,17</td>
</tr>
<tr>
<td>$E$</td>
<td>0,74</td>
</tr>
</tbody>
</table>

Prepared by the authors (2024)

The values of equitability $E$ tend towards one for all the months of the study, which implies that the numbers of prey species consumed by the long-eared owl tend to be in equilibrium with each other. As a result, the raptor behaved as a generalist opportunistic predator.

The results found in the present study are similar to those recorded by Sekouret al. (2010) in the M’sila region, who noted a value of $H = 4.03$ bits and an equitability of 0.76. Similarly, Baziz (2002) obtained a value of $H= 2.34$ bits in Oued Smar and 3.86 bits in the citrus orchard at Palm Beach (Staouéli). For the equi-repartition values, they tend towards one. Explaining a state of equilibrium between the numbers of the different prey species ingested by *Asiootus*. Near Djelfa (southern Algeria), Soutou et al. (2015b) record a medium diversity in the diet of *Asiootus* ($H'=3.47$ bits). While in Spain Délibes et al. (1984), in Switzerland Roulin (1996) and in Turkey Selçuk et al. (2019) report lower Shannon-Weaver diversity index values with 1.38 bits, 1.13 bits and 0.82 bits respectively. This is due to the dominance of a single species over the other species.

According to Szép et al. (2018) in Hungary, the prey of owls changes during winter, as weather conditions can influence hunting success and prey availability. Selçuk et al. (2019) report in the high altitude steppe in summer in Anatolia (Turkey) that *Microtus* sp. is the preferred prey of *Asiootus* resulting in a negative correlation with prey variety in diet composition. For this reason, the Shannon index was low.

Tulis et al. (2021) describe the Long-eared Owl as an opportunistic predator that expands its food niche in the presence of diverse prey. Beskardes et al. (2020), show that the Long-eared Owl changes its feeding habits according to prey abundance and is a generalist opportunist, not a specialist.

The high value of the diversity index $H'$ found in the present study reflects the large number of prey species consumed by the Long-eared Owl in the Daya of el-Gouffa near Laghouat.
4 CONCLUSION

The study of the diet of the long-eared owl *Asiootus* is the first in the Laghouat region. Small mammals, in particular rodents, are an abundant and easily accessible food resource and occupy a predominant place in the diet of this bird of prey. They form the basis of the diet of the Middle Owl with high rates exceeding 96% of the prey-stock. Of the four families of Rodentia, the Gerbillidae family predominates and is highly involved with 92.5%. This family includes in particular *Pachyuromys duprasi* with a rate of 31.1%, followed by *Gerbillus nanus* with 7.7%. The diversity of ingested prey is moderately high (3.1 bits ≤ H' ≤ 4.2 bits). The numbers of prey species tend to be in balance with each other. It should be noted that the long-eared owl *Asiootus* behaves as a generalist opportunistic predator.
REFERENCES


