

# CONTRIBUTION TO THE DISTRIBUTION OF TERRESTRIAL SMALL MAMMALS IN THE SĂLAJ COUNTY, ROMANIA

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**ABSTRACT.** During the research period (2014-2015) 287 small mammals, five species of shrews and eight species of rodents (*Crocidura leucodon*, *C. suaveolens*, *Sorex araneus*, *S. minutus*, *Neomys anomalus*, *Microtus agrestis* *M. arvalis*, *M. subterraneus*, *Myodes glareolus*, *Apodemus agrarius*, *A. flavicollis*, *A. sylvaticus*, *A. uralensis*) were detected in the Sălaj County. The striped field mouse (*Apodemus agrarius*) and the common vole (*Microtus arvalis*) proved to be the characteristic dominant species of the small mammal communities investigated in this area. The number of terrestrial small mammalian species lagged behind our expectations. *Micromys minutus* was not collected during the research period in the habitats characterized by reed-bed and/or tall sedge vegetation.

**Keywords:** terrestrial small mammals, distribution, Sălaj, Romania

## INTRODUCTION:

A considerable amount of faunistical data has been accumulated about the distribution of terrestrial small mammals in Transylvania in the last decades (Banaru, 1997, 1998; Benedek, 2004, 2006, 2007, 2008; Benedek & Drugă, 2005; Benedek et al., 2002; Benedek & Sîrbu, 2009; Istrate, 1998; Lazăr et al., 2012; Mészáros & Murai, 1979; Murai, 1987; Murariu, 1987, 2001, 2002; Murariu & Radulet, 1998; Sike & Gubányi, 2003-2004; Sikó Barabási, 1993; Sikó Barabási et al., 1995, 2011). Despite of it, there are only few records considering the Sălaj County, situated in the northwest of Romania. The records published herein is based on the study of helminths parasitizing terrestrial small mammals in Sălaj, within the joint research program of the Vasile Goldiș Western University of Arad and the Hungarian Natural History Museum entitled "Invertebrate Faunistical Investigation of the Sălaj County".

## MATERIAL AND METHODS

This study is based on the records of small mammals collected in different parts of Sălaj County, Romania for parasitological investigation (Gubányi, 2015b). Line transect method was used with traps (50 pieces/locality) placed at a distance of ten meters from one another. Trapping was conducted for 1-4 days (one to three trap nights) per localities and was checked at two different times of the day in the research period (2014 and 2015). The list of localities is arranged according to Gubányi (2015a) and plotted on the map of Sălaj County (Fig. 1). For the comparability with previous records, we also give the Hungarian names of localities in parentheses after the Romanian names. The systematic order and the scientific names of the species are given according to Wilson & Reeder (2005).

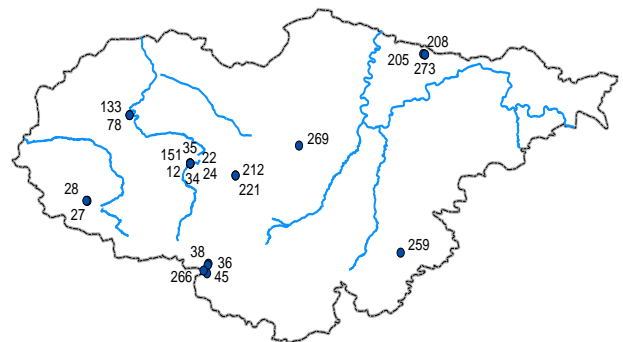


Fig. 1. Map of collecting sites of small mammals in Sălaj County. Numbers of localities is arranged according to Gubányi (2015): 12, 22, 24, 34, 35, 151 – Vârșolț (Varsolc); 27, 28 – Iaz (Krasznajáz); 36, 38, – Huta (Csákyújfalu); 78, 133 – Cehei (Somlyócsehi), Balta Cehei; 205, 208, 273 – Vălișoara (Dióspatak); 212, 221 – Aghireș (Egrespatak); 259 – Ugruti (Ugróc); 45, 266 – Poic, Satul Hurez; 269 - Zalău-Ortelec (Zilah-Vártelek).

## RESULTS

During the research period 281 small mammals were trapped. Five species of shrews (Soricidae) and eight species of rodents (Rodentia) were detected, namely: *Crocidura leucodon*, *C. suaveolens*, *Sorex araneus*, *S. minutus*, *Neomys anomalus*, *Microtus agrestis* *M. arvalis*, *M. subterraneus*, *Myodes glareolus*, *Apodemus agrarius*, *A. flavicollis*, *A. sylvaticus*, *A. uralensis*. Fig 2. shows distribution data for all the small mammalian species collected in Sălaj County in 2014 and 2015.

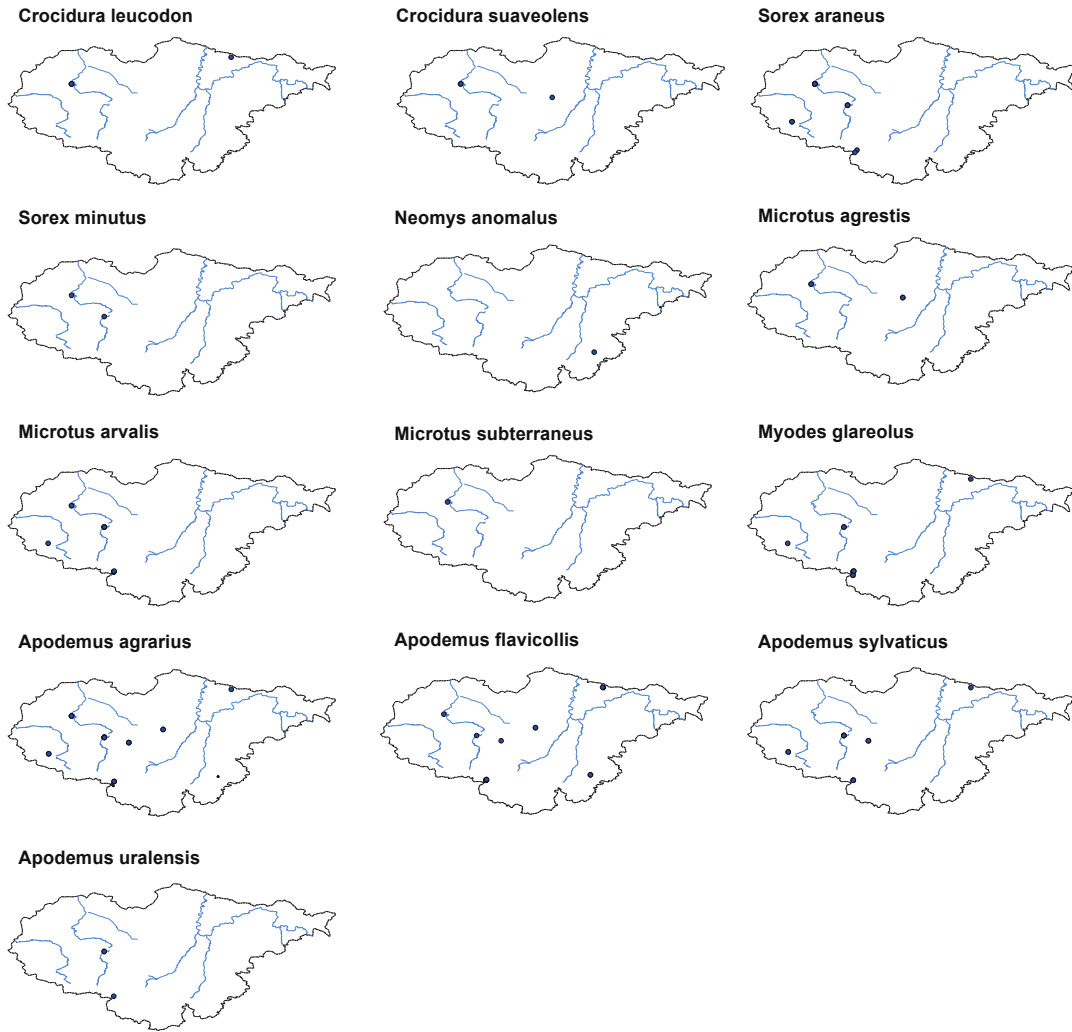


Fig. 2. Distribution data of terrestrial small mammals collected in 2014 and 2015.

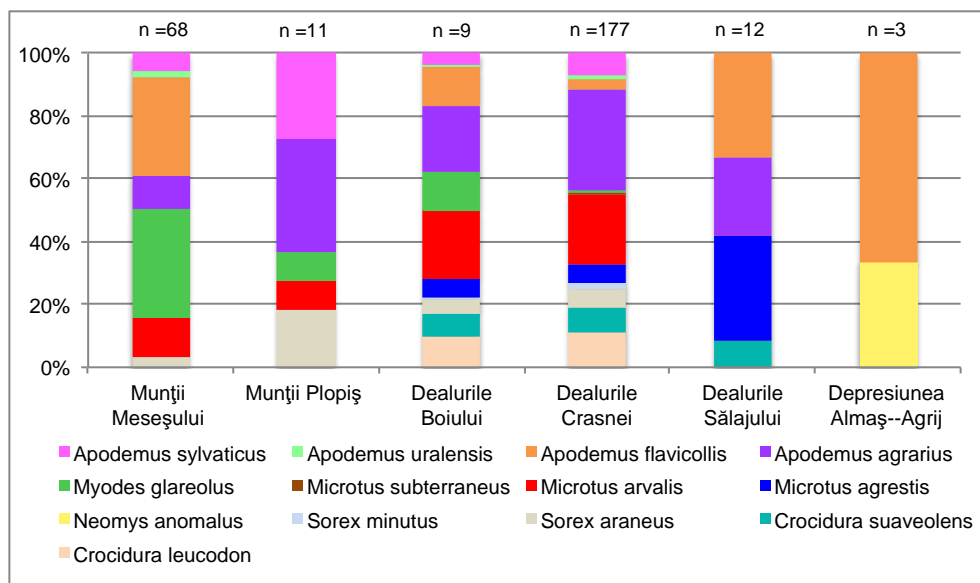


Fig. 3. Frequency distribution of terrestrial small mammals by landscape regions

The prevalence and composition of species were different among landscape regions (Fig. 3). These are partially derived from the different trap nights by

localities and the impact of human activity by grazing, respectively. After standardizing the catches by number of transect lines and trap nights, the success of catching

showed a similar trend as well (Fig. 4). In general, sampling localities of Dealurile Crasnei (Krasznamenti-dombság) proved to be optimal habitats for small mammals. In spite of disturbances (burning, grazing) reed beds and marsh sedges of Cehei Pond Nature Reserve situated in Crasna river floodplain can sustain a diverse small mammalian community year to year. In 2014, *Apodemus agrarius* was the most prevalent species, followed in the dominance order by *Microtus arvalis*, which at that time showed approximately the same prevalence as *A. agrarius*. High capture rate of the *A. agrarius* was obtained in the case of other localities, too. The typically forest-

dwelling vole species *Myodes glareolus*, having a preference for forest habitats, was the dominant in sampling sites of Munții Meseșului (Meszes-hegység) and added diversity to the community in habitats of Munții Plopiș (Réz-hegység) and Dealurile Boiului (Szamoszug), but with low capture rates. At the same time, the other two *Apodemus* species (*A. flavicollis* and *A. sylvaticus*) were found primarily in forest habitats. As regards the shrews, the low density of this group has been detected during the research period. *Sorex araneus* could show higher prevalence in Munții Plopiș (Réz-hegység) and had subdominant position within the community in 2014.

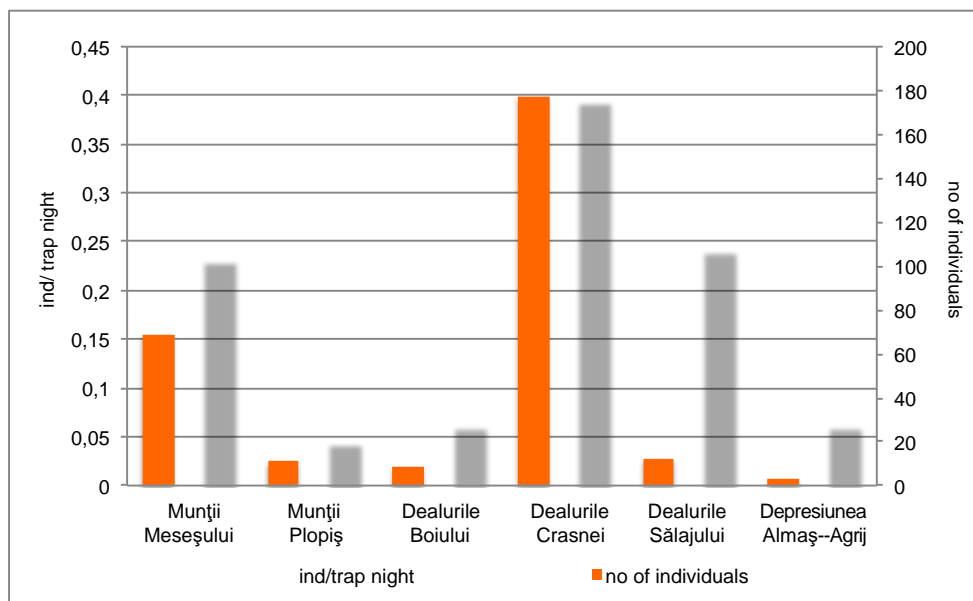


Fig. 4. Total number of individuals and individuals / trap nights by landscape regions

INSECTIVORA  
SORICIDAE

*Crociodura leucodon* (Hermann 1780)

Dealurile Boiului (Szamoszug), SE of Vălișoara (Dióspatak), N47.375726° E23.412241°: 26-27.05.2015 (2♀) — Dealurile Crasnei (Krasznamenti-dombság), 1.5km NNW of Cehei (Somlyócsehi), Balta Cehei, N47.266° E22.755°: 11-14.08.2014 (9♂, 11♀).

*Crociodura suaveolens* (Pallas 1811)

Dealurile Crasnei (Krasznamenti-dombság), 1.5km NNW of Cehei (Somlyócsehi), Balta Cehei, N47.266° E22.755°: 11-14.08.2014 (8♂, 6♀) — Dealurile Sălajului (Szilágymenti-dombság), Zalău-Ortelec (Zilah-Vártelek), oak forest on the top of the hill, seminatural steppe, N47.21078° E23.132415°: 09.09.2015 (1♀).

*Sorex araneus* Linnaeus 1758

Dealurile Crasnei (Krasznamenti-dombság), 1.5km NNW of Cehei (Somlyócsehi), Balta Cehei, N47.266° E22.755°: 11-14.08.2014 (1 ind., 1♀, 2♂), 27-30.04.2015 (1♀); Vârșoț (Varsolc), near Vârșoț Reservoir, N47.17822° E22.89021°: 25.04.2014 (2♂); Vârșoț (Varsolc), near Vârșoț Reservoir, willows, reed bed, gravelly hill, N47.17847° E22.88972°:

21.05.2014 (2♂); Vârșoț, near Vârșoț Reservoir, willows, reed bed, N47.17822° E22.89021°: 28-30.04.2015 (1♀) — Munții Meseșului (Meszes-hegység), Huta (Csákyújfalú), beech forest, N46.99394° E22.92883°: 21-23.05.2014 (1♂); Poic, Satul Hurez, marshy meadow, N46.984257° E22.919834°: 08.09.2015 (1♂) — Munții Plopiș (Réz-hegység), Iaz (Krasznajáz), Mlaștina de la Iaz 1, marsh, N47.11065° E22.66125°: 19-21.05.2014 (1 ind., 1♀).

*Sorex minutus* Linnaeus 1766

Dealurile Crasnei (Krasznamenti-dombság), 1.5km NNW of Cehei (Somlyócsehi), Balta Cehei, N47.266° E22.755°: 11-14.08.2014 (2♂); Vârșoț (Varsolc), near Vârșoț Reservoir, willows, reed bed, gravelly hill, N47.17847° E22.88972°: 21.05.2014 (1♀).

*Neomys anomalus* Cabrera 1907

Depresiunea Almaș--Agrij (Almás—Eg#regy-medence), Ugruțiu (Ugróc), closed steppe, edge of oak forest, N47.016705° E23.358705°: 07.09.2015 (1ind.)

RODENTIA  
CRICETIDAE

*Microtus agrestis* (Linnaeus 1761)

Dealurile Crasnei (Krasznamenti-dombság), 1.5km NNW of Cehei (Somlyócsehi), Balta Cehei, N47.266°

E22.755°: 11–14.08.2014 (4♀, 7♂) — Dealurile Sălajului (Szilágymenti-dombság), Zaláu-Ortelec (Zilah-Vártelek), oak forest on the top of the hill, semi-natural steppe, N47.21078° E23.132415°: 09.09.2015 (2 ind., 2♀).

*Microtus arvalis* (Pallas 1778)

Dealurile Crasnei (Krasznamenti-dombság), 1.5km NNW of Cehei (Somlyócsehi), Balta Cehei, N47.266° E22.755°: 11–14.08.2014 (13♀, 20♂); Vârșoț (Varsolc), near Vârșoț Reservoir, N47.17822° E22.89021°: 25.04.2014 (1♂, 1♀); Vârșoț (Varsolc), near Vârșoț Reservoir, willows, reed bed, N47.17847° E22.88972°: 20.05.2014 (1♀), 21.05.2014 (2♂); Vârșoț, near Vârșoț Reservoir, willows, reed bed, N47.17822° E22.89021°: 28–30.04.2015 (1♂) — Munții Meseșului (Meszes-hegység), Huta (Csákyújfalu), beech forest, N46.99394° E22.92883°: 21–23.05.2014 (3♂, 5♀); Huta (Csákyújfalu), clearing, alder grove at stream, wet meadow, N46.99677° E22.93072°: 21–23.05.2014 (1♀) — Munții Plopiș (Réz-hegység), Iaz (Krasznajáz), Mlaștina de la Iaz 2, puddle, pastures, N47.11088° E22.6589°: 19.05.2014 (1♀).

*Microtus subterraneus* (de Selys-Longchamps 1836)

Dealurile Crasnei (Krasznamenti-dombság), 1.5km NNW of Cehei (Somlyócsehi), Balta Cehei, N47.266° E22.755°: 27–30.04.2015 (1♂).

*Myodes glareolus* Schreber 1780

Dealurile Boiului (Szamoszug), SE of Vălișoara (Dióspatak), N47.375726° E23.412241°: 26–27.05.2015 (1♀) — Dealurile Crasnei (Krasznamenti-dombság), Vârșoț, near Vârșoț Reservoir, willows, reed bed, N47.17822° E22.89021°: 28–30.04.2015 (1♂, 1♀) — Munții Meseșului (Meszes-hegység), Huta (Csákyújfalu), beech forest, N46.99394° E22.92883°: 21–23.05.2014 (1 ind., 6♂, 6♀); Huta (Csákyújfalu), clearing, alder grove at stream, wet meadow, N46.99677° E22.93072°: 21–23.05.2014 (4♂, 5♀); Poic, Satul Hurez, alder grove, wet meadow, N46.97925° E22.92752°: 22.05.2014 (1♂, 1♀) — Munții Plopiș (Réz-hegység), Iaz (Krasznajáz), Mlaștina de la Iaz 2, puddle, pastures, N47.11088° E22.6589°: 19.05.2014 (1♂).

MURIDAE

*Apodemus agrarius* (Pallas 1771)

Dealurile Boiului (Szamoszug), Vălișoara (Dióspatak), stream valley, N47.375697° E23.412971°: 10.09.2015 (1♂) — Dealurile Crasnei (Krasznamenti-dombság), 1.5km NNW of Cehei (Somlyócsehi), Balta Cehei, N47.266° E22.755°: 11–14.08.2014 (11♂, 12♀), 27–30.04.2015 (3♀, 5♂); Vârșoț (Varsolc), near Vârșoț Reservoir, N47.17822° E22.89021°: 24.04.2014 (3♀, 7♂); Vârșoț (Varsolc), near Vârșoț Reservoir, willows, reed bed, N47.17847° E22.88972°: 20.05.2014 (4♂), 21.05.2014 (3♂, 4♀); Vârșoț, near Vârșoț Reservoir, willows, reed bed, N47.17822° E22.89021°: 28–30.04.2015 (1♂); W of Aghireș (Egrespatak), xeromesophile grassland and forest edge, N47.156611° E22.990925°: 27–28.05.2015 (4♂) —

Dealurile Sălajului (Szilágymenti-dombság), Zaláu-Ortelec (Zilah-Vártelek), oak forest on the top of the hill, semi-natural steppe, N47.21078° E23.132415°: 09.09.2015 (1♂, 2♀) — Munții Meseșului (Meszes-hegység), Huta (Csákyújfalu), clearing, alder grove at stream, wet meadow, N46.99677° E22.93072°: 21–23.05.2014 (4♂, 3♀) — Munții Plopiș (Réz-hegység), Iaz (Krasznajáz), Mlaștina de la Iaz 1, marsh, N47.11065° E22.66125°: 19–21.05.2014 (2♂, 2♀).

*Apodemus flavicollis* (Melchior 1834)

Dealurile Boiului (Szamoszug), SE of Vălișoara (Dióspatak), N47.376865° E23.408879°: 26–27.05.2015 (1♀, 3♂) — Dealurile Crasnei (Krasznamenti-dombság), 1.5km NNW of Cehei (Somlyócsehi), Balta Cehei, N47.266° E22.755°: 11–14.08.2014 (3♂); Vârșoț (Varsolc), near Vârșoț Reservoir, N47.17822° E22.89021°: 24.04.2014 (1♂); W of Aghireș (Egrespatak), xeromesophile grassland and forest edge, N47.156611° E22.990925°: 27–28.05.2015 (1♂) — Dealurile Sălajului (Szilágymenti-dombság), Zaláu-Ortelec (Zilah-Vártelek), oak forest on the top of the hill, semi-natural steppe, N47.21078° E23.132415°: 09.09.2015 (4♂) — Depresiunea Almaș-Agrij (Almăș-Egregy-medence), Ugruțiu (Ugróc), closed steppe, edge of oak forest, N47.016705° E23.358705°: 07.09.2015 (1♂, 1♀) — Munții Meseșului (Meszes-hegység), Huta (Csákyújfalu), beech forest, N46.99394° E22.92883°: 21–23.05.2014 (1 ind., 10♂, 8♀); Huta (Csákyújfalu), clearing, alder grove at stream, wet meadow, N46.99677° E22.93072°: 21–23.05.2014 (3♂).

*Apodemus sylvaticus* (Linnaeus 1758)

Dealurile Boiului (Szamoszug), Vălișoara (Dióspatak), stream valley, N47.375697° E23.412971°: 10.09.2015 (1♂) — Dealurile Crasnei (Krasznamenti-dombság), Vârșoț (Varsolc), near Vârșoț Reservoir, willows, reed bed, N47.17847° E22.88972°: 21.05.2014 (2♂, 4♀); Vârșoț, near Vârșoț Reservoir, willows, reed bed, N47.17822° E22.89021°: 28–30.04.2015 (1♀, 3♂); W of Aghireș (Egrespatak), xeromesophile grassland and forest edge, N47.156611° E22.990925°: 28–29.05.2015 (1♂, 1♀) — Munții Meseșului (Meszes-hegység), Huta (Csákyújfalu), beech forest, N46.99394° E22.92883°: 21–23.05.2014 (1♂, 3♀) — Munții Plopiș (Réz-hegység), Iaz (Krasznajáz), Mlaștina de la Iaz 1, marsh, N47.11065° E22.66125°: 19–21.05.2014 (1♀, 2♂).

*Apodemus uralensis* (Pallas 1881)

Dealurile Crasnei (Krasznamenti-dombság), Vârșoț (Varsolc), near Vârșoț Reservoir, willows, reed bed, N47.17847° E22.88972°: 20.05.2014 (1♂, 2♀) — Munții Meseșului (Meszes-hegység), Huta (Csákyújfalu), beech forest, N46.99394° E22.92883°: 21–23.05.2014 (1♂).

**CONCLUSION**

As shown by the results of trappings performed in the years 2014–2015, the area selected for collectings in the territory of the Sălaj County proved to be more or less optimal habitats for terrestrial small mammals.

*Apodemus agrarius* and *Microtus arvalis* seemed to be the characteristic species of the small mammal communities detected in this area. *Myodes glareolus* mostly appeared in the forest habitats. At the same time, the species preferring wet habitats, such as *S. araneus*, *S. minutus* showed relatively low prevalence. Surprisingly, *Micromys minutus* wasn't detected during the research period in the habitats characterized by reed-bed and/or tall sedge vegetation. Taking into account trapping periods and number of the site visited, data of five species of shrews (Soricidae) and eight species of rodents (Rodentia) contributed considerable to knowledge of mammals of the Sălaj County.

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